

**University of Minnesota Duluth
Bulletin**

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JUNE 30, 1972

duluth-general bulletin



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Odin M. Langsjoen, Director, Dental Hygiene Program—Duluth, 417 Administration Building

M. Harry Lease, Jr., Assistant Dean, Graduate School, 403 Administration Building

William R. McEwen, Chairman, Division of Science and Mathematics, 108 Science-Mathematics Building

Valworth R. Plumb, Chairman, Division of Education and Psychology, 125 Education Building

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Norman L. Rick, Superintendent of Plant Services, 241 Administration Building

Ralph A. Romano, Director of Athletics, 120 Physical Education Building

Arthur E. Smith, Chairman, Division of Humanities, 212 Humanities Building

Frederick T. Witzig, Chairman, Division of Social Sciences, 107 Social Science Building

General Bulletin

UNIVERSITY OF MINNESOTA, DULUTH

HOW TO USE THIS BULLETIN

This bulletin is the official source of information about the University of Minnesota, Duluth. Bring it each time you plan a study program with your adviser and each time you register. Use the Index for reference to specific items.

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SYMBOLS

A course sequence separated by commas (1-001, 1-002) may be taken in any order.

A course sequence separated by diagonals (1-001/1-002) must be taken in the order listed.

If no prerequisites are listed, there are none, except courses numbered 3-000 or above indicate a minimum class standing requirement. When a course is listed as a prerequisite, it is assumed that an equivalent course may be substituted to meet the requirement.

When no departmental abbreviated prefix precedes the number of a course listed as a prerequisite, the prerequisite course is in the same department as the course being described.

The following standard bulletin symbols are used throughout the course descriptions and will not carry any page footnotes:

° Graduate students may prepare Plan B papers.

† To receive credit, all courses listed before single dagger must be completed.

§ No credit granted if credit has been received for equivalent course listed after section mark.

¶ Concurrent registration is allowed with course listed after paragraph mark.

Consent of instructor is required prior to registration.

△ Consent of department offering course is required prior to registration.

A variable-credit course offering with the credits separated by a hyphen (1-3 cr) is offered for variable credit at the student's option.

A variable-credit course offering with the credits separated by the word "to" (1 to 4 cr) is offered for variable credit at the department's option. Students should consult the current *Class Schedule* for information concerning available credits.

Note—For definitions of course levels by number, see page 36.

UNIVERSITY OF MINNESOTA, DULUTH

SECTION 1

General Information

PURPOSE AND ORGANIZATION

Established in 1851 by an act of the Minnesota territorial legislature, the University of Minnesota is an autonomous body governed by the Board of Regents who enact laws governing the institution, control expenditures, and act upon all staff changes.

The Regents are 12 individuals appointed by the state legislature. The President of the University is *ex officio* president of the Board of Regents. He is directly responsible to the board as chief executive officer of the University.

Establishment of the Duluth Campus

The University of Minnesota, Duluth (UMD) became a coordinate campus of the University of Minnesota by legislative act on July 1, 1947. Responsibility for its administration rests in the hands of a provost, who reports directly to the President of the University.

Standards of staffing comparable to those elsewhere in the University make possible the offering of similar courses at UMD. Diplomas are identical to those granted in the Twin Cities. Careful planning permits transfer between campuses without loss of time or credit.

As a campus of the University, UMD is fully accredited by the North Central Association of Colleges and Secondary Schools. It is accredited separately by the National Council for Accreditation of Teacher Education, the American Chemical Society, National Association of Schools of Music, and the American Association of University Women.

Human Rights

The Board of Regents has committed itself and the University of Minnesota to the policy that there shall be no discrimination in the treatment of persons because of race, creed, color, sex, or national origin. This is a guiding policy in the admission of students in all colleges and in their academic pursuits. It is also to be a governing principle in University-owned and University-approved housing, in food services, student unions, extracurricular activities, and all other student and staff services. This policy must also be adhered to in the employment of students either by the University or by outsiders through the University and in the employment of faculty and civil service staff.

Purposes of the Campus

As a coordinate campus of the University, the University of Minnesota, Duluth strives to accomplish the following purposes:

1. Development of the art of critical thinking
2. Examination of basic values in light of the thought and experience of mankind
3. Preparation for leadership and social responsibility including tolerance of the ideas of others
4. Encouragement of broad cultural and intellectual interests
5. Development of effective communication ability
6. Development of vocationally useful abilities

To help the student achieve these purposes, UMD offers opportunities for many kinds of educational experience. Growth in the individual student depends largely on the use each makes of these opportunities, including the advice of teachers, advisers, and counselors. UMD believes that growth is an individual process and that, although the results are not equal for all, education should encourage self-reliance based on self-understanding. Therefore, each student is required to take final responsibility for his own academic progress and personal conduct.

The faculty expects every student to achieve a reasonable balance between liberal and special education. To help him achieve this balance, UMD has established a relatively flexible liberal education program, special academic and degree requirements, and unlimited opportunity for individual study. The intellectual treasures of mankind are readily available to those whose vision and scholarly interest prompt them to strive toward the limits of individual excellence.

In addition to classroom activities, the student will benefit from the educational opportunities offered through special lectures, concerts, the theater, library, art gallery, the many organized student activities, and occasions for informal talks with friends, teachers, and counselors.

ACADEMIC PROGRAMS

The University of Minnesota, Duluth offers study opportunities in the following academic programs:

- A 4-year liberal arts curriculum
- A 4-year program for prospective elementary and secondary school teachers
- A 4-year program leading to the bachelor of accounting degree
- A 4-year program leading to the bachelor of business administration degree
- A 4-year program leading to the bachelor of social work degree (subject to approval by the Board of Regents)
- Preprofessional training of 1 or more years' duration
- Two years of study leading to the associate in arts degree in liberal arts
- Two years of study leading to the associate in arts degree in dental hygiene
- A 2-year basic sciences medical school program leading toward the M.D. degree through transfer to the University of Minnesota Medical School, or other medical schools
- Master's degree programs for elementary school teachers and principals, secondary school teachers and principals, and secondary school counselors
- Master's degree programs in art, biology, botany, chemistry, English, geology, history, physics, speech pathology, and zoology

Master of social work degree

A Specialist Certificate in Education, a 2-year program, is offered in elementary, secondary, and general school administration

Organization of the Duluth Campus

ADMINISTRATIVE DIVISIONS

Directly responsible to the provost are the vice provosts for academic administration, business affairs, and students affairs.

The vice provost for academic administration is responsible for the various major academic units on the Duluth Campus, including the four academic divisions (Education and Psychology, Humanities, Science and Mathematics, and Social Sciences), the Department of Aerospace Studies, the School of Medicine-Duluth, the Dental Hygiene Program, and the School of Social Work-Duluth. He is also responsible for the direct academic support units including library and educational media. In addition, the vice provost for academic administration assists in the coordination of programs offered on the UMD campus by the Graduate School of the University of Minnesota through the office of the assistant dean of the Graduate School on the Duluth Campus.

The vice provost for business affairs is responsible for financial records, collection of tuition and fees, disbursement of refunds, hospitalization insurance, civil service personnel records, transportation pool, real estate, and payments on loans. He supervises operation of plant services, the campus bookstore, food services, vending, printing, and residence halls.

The vice provost for student affairs is responsible for the general area of admissions and records; testing, counseling, and advisement programs; loans and scholarships; student placement and employment; student activities and operation of Kirby Student Center; student housing; and discipline.

ADMINISTRATION OF ACADEMIC PROGRAMS

Duluth Campus curricula and departments are administered within the various academic units listed above. Departmental majors, minors, and course offerings are first approved by the department, are reviewed by a curriculum committee within the major academic unit, and are submitted to the campus curriculum committee for final approval. The programs of the major academic units are described below.

Division of Education and Psychology

The Division of Education and Psychology consists of the Departments of Elementary Education, Home Economics, Industrial Education, Physical Education, Psychology, Secondary Education, Special Education, and Speech Pathology and Audiology. Preparation for teaching in secondary fields, as well as in elementary education, is available through the earning of the bachelor of science degree. The Departments of Special Education and Speech Pathology and Audiology prepare teachers for specialized assignments in schools. The bachelor of arts degree is available within certain departments of the division for those desiring careers in areas other than teaching.

At the graduate (M.A.) level, the division offers majors in education, educational administration, and educational psychology. A Specialist Certificate is offered in educational administration.

Division of Humanities

The Division of Humanities offers instruction in art, drama, humanities, languages, literature, music, philosophy, speech, and writing. Opportunity to develop a sound understanding and appreciation of these subjects and training in creative expression and performing skills are provided through a wide range of courses. In addition, the course offerings are arranged to enable the student to prepare for teaching in elementary and secondary schools. Art and English majors are offered at the graduate (M.A.) level.

Some departments in the division offer honors courses in the senior year to superior students selected by the faculty of their major departments. Students who complete the honors courses receive course credits for their work.

Division of Science and Mathematics

The Division of Science and Mathematics consists of the Departments of Biology, Chemistry, Geology, Mathematics and Engineering, and Physics. The division offers majors in biology, botany, chemistry, geology, physics, and zoology at the graduate (M.S.) level, and has principal responsibility for some of the preprofessional and pretechnical programs described in Section 3. The teaching and research space for the division is located in the Science, Science-Mathematics, Life Science Buildings, and the Alworth Planetarium. Students as well as faculty are actively engaged in research projects.

Division of Social Sciences

The Division of Social Sciences includes the fields of anthropology, business administration, economics, geography, history, political science, and sociology. Each field is approached through general content courses, embracing fundamental principles and factual knowledge. Advanced courses have been designed for students who elect more intensive work in any one field. A history major is offered at the graduate (M.A.) level, and an undergraduate major in urban studies is available as an interdisciplinary social science program.

The social sciences seek to improve the student's understanding of the activities of man, his problems and accomplishments, and his prospects for the future. The courses offered in this division extend beyond the appreciation of the facts of man's development and the accumulation of knowledge. They seek to stimulate curiosity, interest, and active participation in contemporary affairs. It is hoped that through the social sciences the student will develop a strong sense of civic responsibility, fortified by a critical attitude that will make citizenship vital and constructive in all of its aspects.

Department of Aerospace Studies

(USAF Reserve Officers' Training Corps)

The Department of Aerospace Studies offers a 4-year and a 2-year officer training program. The General Military Course is "voluntary" and includes the freshman and sophomore years. The Professional Officer Course is "voluntary" and "selective" and includes the junior and senior years. The 2-year officer training program does not require the General Military Course as a prerequisite for entrance in the Professional Officer Course.

Dental Hygiene Program

The Dental Hygiene Program at UMD is a special 2-year curriculum combining general education courses, biomedical and dental science courses, and clinical experience leading to an associate in arts degree in dental hygiene. Successful completion of this course of study and training qualifies the graduate to participate in state and national licensing board examinations (a dental hygienist must hold a current license to practice). With proper course selection, a 4-year student may earn a bachelor of science degree with dental hygiene as the core area of concentration.

School of Medicine—Duluth

The School of Medicine—Duluth was established in 1969 with the enactment of enabling legislation by the Minnesota State Legislature. At the present time, it is the only school being developed by a major university as its second medical school.

Designed initially as a 2-year basic sciences medical school program, special transfer mechanisms within the University of Minnesota enable Duluth medical students to complete their medical education on the Minneapolis Campus. Transfer to other institutions will also be possible.

The Duluth Campus medical education program orientation is toward the production of broadly based general or family practice physicians. A regional approach to education and health care in the generalist mode will be stressed. Areas of particular interest include the rural and semirural portions of the region, minority group care and education, and experimental interdisciplinary educational models in preparation for a future broadly based medical practice.

Curricular innovations incorporated in the program include early exposure to clinical medicine and patient contact, integrated instruction between basic and clinical sciences, and close student-faculty contact.

The first class of 24 students will be accepted for matriculation in September of 1972.

School of Social Work—Duluth

After a 2-year feasibility study, the Minnesota Legislature appropriated funds and the Board of Regents authorized the establishment of a graduate School of Social Work at the University of Minnesota, Duluth in the spring of 1971. The objective of the School is to prepare students for careers in regional and national social development. Graduates will fill the growing number of social planning roles in community, state, federal, and international organizations. This curriculum will also be of interest to those considering careers in social work administration. In addition, a concentration will be available to those wishing to specialize in criminal justice planning. Persons interested in this curriculum should direct inquiries to the Director, School of Social Work—Duluth, 2627 East 7th Street, Duluth, Minnesota 55812.

FACILITIES AND SERVICES

Facilities

The Duluth Campus consists of several tracts in Duluth's eastern section and in outlying areas. The two largest tracts are the 227-acre upper campus and the 10-acre lower campus.

UPPER CAMPUS

UMD's upper campus affords not only a scenic view of Lake Superior but also quick access to downtown Duluth and area community centers. It was given to the University by Duluth citizens and civic groups and is being developed by University architects, site planners, and UMD faculty and staff.

Buildings completed on the upper campus include:

Administration Building—Completed in 1971, this five-story building provides offices, conference rooms, special purpose workrooms, and shipping and mailing facilities. The building houses administrative offices, the Business Office, the News Service, Plant Services, Student Affairs, and Continuing Education and Extension.

Classroom Building—This building accommodates the Departments of History, Political Science, Speech, and Sociology. It also contains nine uniquely designed "case-study" rooms and several art studios.

Darling Observatory—One of UMD's most popular attractions. The observatory was willed to the University by John H. Darling. A 9-inch refracting telescope and other optical equipment is available in the observatory. Starting in 1973, the observatory will be located on the roof of the new science classroom-laboratory building.

Drug Education and Information Center—This new center is located in a former private residence on College Street, a short distance west of the heating plant.

Education Building—This building provides classrooms and offices for the Departments of Elementary, Secondary, and Special Education and the Department of Psychology. Special facilities include psychology laboratories, reading clinic, learning resources center, vending services, closed circuit TV, KUMD-FM, and a 395-seat auditorium.

Food Service Center—Located between Kirby Student Center and the Residence Hall Complex, this center houses dining facilities for 1,500 students in an overhead bridge structure, and a complete service-delivery facility underground.

Griggs Field—A 3,800-seat stadium with lighting for night football games. The field is named after Richard L. Griggs who provided funds for the facility.

Health Service—Offices and examining rooms for the Health Service are located at 1215 University Circle. A full-time doctor and nurse are available during daytime hours for student consultation.

Heating Plant—Located just off College Street, the facility will eventually house shops and garages for plant services.

Home Economics Building—Located on Ordean Court, this structure includes, in addition to the Department of Home Economics, several general purpose classrooms and two auditorium units.

Humanities Building—This building is the first of several structures planned for the fine arts. It currently accommodates the Departments of Art, Music, Speech, Speech Pathology and Audiology, English, Language, and Philosophy.

Industrial Education Building—Laboratories, printing services, classrooms, and faculty offices for the Department of Industrial Education are provided in this building.

Kirby Student Center—Named to commemorate Stephen R. Kirby, Duluth and Iron Range civic and business leader, who made the major individual contribution towards its construction. The center includes student organization and activity rooms, Campus Club, cafeteria, ballroom, music lounge, a bookstore, and other special-purpose rooms. A two-story addition above the bookstore provides space for the Bull Pub and The Rafter's, two popular student meeting places.

Library—The Library complex contains the main book (approximately 148,000 volumes) and periodical collections (approximately 1,500), and has several reading rooms. Duplicating and microfilm equipment are also available in the Library.

Marshall W. Alworth Planetarium—The Planetarium, located near the western edge of the campus, is used by UMD students, area public school students, and the public. The Planetarium is named for Marshall W. Alworth, who provided funds for the facility.

Ordean Court—Located on the east side of the campus, the court is a memorial to Albert L. Ordean. The court contains the statue of Daniel Greysolon, Sieur du Luth, which was created by Jacques Lipchitz.

Performing Arts Center—The center, which includes a 600-seat theater, a small experimental theater, classrooms, and offices, provides performance and rehearsal space for many groups on campus.

Physical Education Building—This building includes a large and a small gymnasium for men and for women, a swimming pool, classrooms, faculty offices, and special-purpose rooms. Track facilities and tennis courts are located near the building, and a skating rink is maintained nearby in winter.

ROTC Building—This compact structure provides offices for the AFROTC staff, classrooms, cadet lounge, supply, and other facilities.

Residence Halls—Four residence halls for single students are available on the upper campus. They include Burntside Hall, Griggs Hall, Vermilion Hall, and a new 400-bed residence hall completed in the fall of 1971. In addition to the residence halls described here, two other residence halls are located on the lower campus. Seventy-six apartment units, each housing four students, are located in an attractive wooded area on campus. A student service center for these units was completed in 1971.

Rock Hill Arboretum—This 13-acre tract is a unique study and recreational area immediately adjacent to the campus. Included in the area are 2 miles of nature trails, an observation deck, a ski slope with rope tow, and a flora of unusual diversity. Much of the area included in the arboretum was donated to the University by the William R. Bagley family.

Science-Mathematics Building Complex—Three buildings, the Science Building, the Science-Mathematics Building, and the Life Science Building, make up the complex. Included are a 400-seat auditorium, two 200-seat lecture halls, numerous laboratories and classrooms, two greenhouses, and offices for faculty.

Social Science Building—Classrooms and faculty offices for the Departments of Geography, Business Administration, and Economics are provided in this building.

Tweed Museum of Art—Adjoining the Humanities Building, Tweed Museum, donated by Mrs. Alice Tweed Tuohy and her daughter, Mrs. John W. (Bernice Tweed) Brickson, includes exhibition and storage facilities for the Tweed collection of paintings. A major addition to Tweed Museum, funded by Mrs. Tuohy, was dedicated November 5, 1965. The Board of Regents named it the Alice Tweed Tuohy Room.

LOWER CAMPUS

The lower campus includes buildings constructed prior to 1947. They accommodated UMD's predecessors, Duluth State Teachers College and Duluth State Normal School.

Main Building—Offices maintained in this building include the Educational Research and Development Council of Northeast Minnesota; North Central Forest Experiment Station, Duluth Office; Soil Conservation Service; South St. Louis County Agricultural Extension Service; and the Cooperative Extension Service. It also includes a small gymnasium, an auditorium with a seating capacity of about 500 people, a little theater, and several research rooms.

Medical Education Building—Located at 2205 East Fifth Street, this former classroom building now provides teaching and research space for the UMD Medical Education Program. The building was converted in 1972 for temporary use by the Medical School.

Torrance Hall—Residence hall for 75 men.

Washburn Hall—Residence hall for 45 women.

Bus service is provided between residence halls on the lower campus and the Kirby Student Center on the upper campus.

OTHER FACILITIES

Donors also have contributed several other properties to UMD. These include:

Alworth Apartments—These apartments, located in a building on the former Royal D. Alworth estate, are used as temporary housing for new faculty and staff.

Limnological Research Center—This center for limnological work on Lake Superior, located at the mouth of Lester River, provides summer laboratory space for University scientists.

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Provost's Residence—The former George P. Tweed home, located at 2531 East Seventh Street, was given to the University by Mrs. Alice Tweed Tuohy.

School of Social Work Building—This building, which was donated to the University by the Royal D. Alworth family, is located at 2627 East Seventh Street. It now provides office, classroom, and seminar space for the new program in social work.

Library

The Duluth Campus Library has a rapidly growing collection which now exceeds 160,000 volumes. More than 2,000 magazines, newspapers, and other serials, both foreign and domestic, are received currently. As part of the University of Minnesota, and the Minutex Network, the Library has access, via teletype, to resources which total over 3,000,000 volumes. As a partner in the Center for Research Libraries, UMD has access to other extensive collections.

The Library Building is new, modern, and spacious. The first floor has the reserve reading room, and auxiliary study hall, and the late-hour study room which remains open until 1 a.m. every night. Also on the first floor is the Children's Library, a model school library with 12,000 volumes, and the Teaching Materials Library with 15,000 school texts, courses of study, teaching manuals, and other instructional materials. On the second or main floor are the card catalog, circulation desk, reference and periodical collections, and the periodical abstracts and indexes. Also on the second floor are facilities for viewing microfilm and listening to tapes and recordings. The major book collection is located on the third floor. There are lounge areas and group studies on each floor. Carrels and study tables are interspersed with book-stacks throughout the building providing easy access to books and ample space for study.

Branch libraries include departmental collections in biology, geology, and chemistry/physics. There is also, on the third floor of the Library Building, the Health Science Library, a new and rapidly growing department which serves the needs of the health education and dental hygiene programs. In addition to books and journals in the health sciences, this department offers professional reference service to the medical community.

The library collections are built around the curricular offerings and are broad enough to encourage individual study and recreational reading. The Library also has comprehensive collections in microformat, including several thousand reels of microfilm. All United States depository documents are received on microprint. The collection of phonorecords and audio tape cassettes includes several hundred recordings of plays, poetry, speeches, lectures, and symposia. There is a special collection on area history called the Voyageur Collection, and another collection on black culture called the Bonga Collection. Photoduplication services are available for a nominal fee. A competent professional staff is on hand to help interpret the collections and to give bibliographic and reference assistance.

Student Services

The Duluth Campus has many services available to assist students with their progress in college and with problems related to campus life. These services are intended to help each student take full advantage of the opportunities open to him. They are summarized below.

ADMISSION AND TRANSFER ASSISTANCE

Prospective freshman students and transfer students from other institutions and also students in other colleges within the University of Minnesota can receive assistance and information through the Admissions Office. High school students are encouraged to apply before April 1 of their senior year for fall quarter admission. Admission for transfer students will be facilitated by an early application and evaluation of their credits. Transfer students who wish to graduate from UMD must meet appropriate degree requirements as outlined in the bulletin, pages 44-45.

RECORDS AND REGISTRATION

Maintenance of student academic records and assistance with registration and change in registration may be obtained at the Registration Window in the Administration Building. Requests for graduation, teacher certification, Veterans and Social Security benefits, transcripts, and other student record information are processed through this office.

ON-CAMPUS HOUSING

Requests for information or assistance in securing board and room accommodations in the residence halls should be addressed to Housing Office, Administration Building, University of Minnesota, Duluth, Duluth, Minnesota 55812. A current rate sheet together with an application-contract will be provided.

A student is encouraged to make housing arrangements during the winter or early spring prior to fall quarter registration. A reservation for University housing can be requested by sending an application-contract together with a \$15 nonrefundable deposit to the Housing Office. The reservation is confirmed when the Housing Office notifies the student that space is available. The student should be aware that the application for on-campus housing does not include application for admission. Neither application for admission nor acceptance constitutes application or reservation for on-campus housing.

Advance Room and Board Payment

Once the application is accepted and confirmed, an advance payment of \$100 is due by August 15. If the advance is not received by August 15, the application-contract may be canceled and the \$15 deposit forfeited. The advance payment and deposit will be credited on the first-quarter room and board. Rooms in the residence halls of the upper campus are equipped with a telephone, and quarterly charges are included in the room and board rates.

Accommodations are available for men and women in the residence hall units on the upper campus and in Torrance Hall and Washburn Hall on the lower campus. Rates for these facilities include board and room. All rooms are furnished with beds, chairs, desks, lamps, and bookcases. Bed linen, spreads, and necessary blankets are supplied. Students should bring any extra blankets desired, towels, and other personal necessities. Each residence hall contains lounge, kitchenette, and laundry facilities. The meals are served in the Kirby Student Center cafeteria. On-campus living offers a valuable opportunity for group living, with varied student activity programs available to all students. There is a limited number of administrative and counseling

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positions available in University residence halls. These are open to both undergraduate and graduate students. Students interested in this work should contact the Housing Office for additional information.

OFF-CAMPUS HOUSING

Current listings of off-campus housing facilities for students are available in the Housing Office, Administration Building. Reservations for off-campus housing are the responsibility of the individual student. To be assured of adequate quarters, students should visit the campus and make arrangements with the homeowner at an early date, before classes begin. Desirable rooms in private residences are usually available in the vicinity of the University. Prices range from \$35 to \$50 a month per person. Some private homes furnish light housekeeping facilities. A limited number of apartments is available, with rentals ranging from \$75 and upward. Ordinarily, off-campus living accommodations are rented by the month. Many landlords require an advance deposit when the room is engaged. The student should satisfy himself that the room is acceptable before making a deposit and should establish the exact period for which the room is to be rented. Whatever arrangements are made with the householder, housing regulations provide that the student, if he plans to move, must give adequate notice on the basis of the date of the rental pay period. Any change of address or problem concerning living conditions should be reported immediately to the Housing Office.

ORIENTATION AND ADVISEMENT

Orientation programs are planned for all new students. The most comprehensive orientation activities are planned for the students entering in the fall quarter. Many and varied programs are conducted for new students to assist them in beginning their college work. Registration and orientation activities for new freshman and transfer students are scheduled late in the summer. New students are usually informed as to exact registration dates and other details by July 1. The primary aim of the advisement program at the University of Minnesota, Duluth, is to assist each individual to function to his maximum potential. Each new student is assigned an academic adviser. Establishment of a close working relationship between the faculty member serving as academic adviser and the student leads to a better understanding of college responsibilities, curricular requirements, and other factors affecting student achievement. Any student who has academic or vocational concerns is encouraged to discuss them with his adviser. Specific questions about orientation or advisement should be addressed to the Orientation-Advisement Office, Administration Building.

STUDENT FINANCIAL AID

Information about scholarships, grants, loans, and part-time employment may be obtained from the Office of Financial Aids, Administration Building, UMD.

Information for Entering Freshman Candidates

Contact your high school counselor and/or principal for information about necessary forms and programs of financial aid. To be considered for scholarship, Educational Opportunity Grant, College Work-Study Program, or

National Defense Student Loan, students must complete the requirements for admissions, submit a financial aid application, and have their parents complete the required Parents' Confidential Statement. Qualified students who desire consideration for scholarship, grants, or loans must complete the above-mentioned steps before **February 15**.

Information for Transfer Candidates

Students who are currently attending other colleges, but plan to transfer to UMD and desire to be considered for scholarship, College Work-Study Program, Educational Opportunity Grant, or National Defense Student Loan must complete all of the requirements for admission to the University of Minnesota, Duluth, submit a financial aid application, and supply evidence of need by having their parents complete the Parents' Confidential Statement. In order to be considered they must complete the above mentioned steps before *February 15*.

Information for Students Presently Enrolled

Students currently enrolled at the University of Minnesota, Duluth, who desire to be considered for initial or renewal scholarships, Educational Opportunity Grant, College Work-Study, or National Defense Student Loan, must complete a financial aid application and supply evidence of need by having their parents complete the required Parents' Confidential Statement.

Notification of awards is usually for the academic year but in some cases will cover 1 or 2 quarters depending on the student's need.

COUNSELING

The Counseling Office has been established to aid students in becoming maximally effective as students and persons. Students may consult with personnel of the Counseling Office on any personal, financial, educational, social, and other problems, or they may be referred to this office by their adviser or instructors. In conjunction with such counseling, a wide range of appropriate tests is available as well as bulletins of information on admissions testing for professional or graduate school. In addition, an occupational library is maintained which students may use at any time.

Appointments are scheduled in advance by either writing, calling, or visiting the Counseling Office located in the Administration Building. A student may request a particular counselor. In emergencies, a student can be seen almost immediately.

Counseling interviews are scheduled for 30 to 45 minutes each. Initially the counselor seeks to clarify the problem and arrange a plan of action. This plan may involve counseling oriented toward vocational, educational, social, marital, or personal problems. It may include aptitude, interest, achievement or personality tests, special seminars, or group discussions, or it may involve helping a student arrange for an appropriate source of help. If in doubt whether the Counseling Office is the place to get the help needed, a student should simply make an appointment.

Counseling is not telling a student what to do; he must make the decisions. Emphasis is placed on the ultimate responsibility of each student for conducting his own life and making the most of it. The counselor's job is to help a student understand better the significance of his feelings, attitudes, aptitudes, and other personal factors.

UNIVERSITY HEALTH SERVICE—DULUTH

The University Health Service is located at 1215 East University Circle. Patients who register at the Health Service Monday through Friday between 9 a.m. to 3 p.m. may be seen by the doctor. The nurse is on duty Monday through Friday, 8 a.m. to 4 p.m. The services of a psychiatrist are available by appointment.

Consultation service is available for every student. Services include care of illnesses and injuries, immunizations, laboratory tests, physical examinations, physiotherapy which includes diathermy, some medication, and free emergency ambulance service from UMD to local hospitals. House calls will be made in case of emergency. For such calls a standard fee will be charged. When a UMD student requires emergency care or diagnosis after the Health Service is closed, the student may be cared for by doctors at St. Luke's Hospital and St. Mary's Hospital Emergency Rooms. If nature of call is an emergency, the Student Supplemental Blue Cross and Blue Shield Insurance usually will cover the expense incurred. Commonly used medications and drugs are available on a cost basis when prescribed through the Health Service.

SPEECH AND HEARING CLINIC

The Speech and Hearing Clinic has facilities for University students with speech and/or hearing disorders. Students who desire remedial help should apply at 130 Humanities Building early in the quarter.

FOOD SERVICE

A complete range of food service is available, including the cafeteria, the VenDen vending room, the Bull Pub snack bar, and The Rafters bag lunch-study hall. Special food service ranging from simple luncheons to buffets or banquets can be arranged with the Food Service Department. (See item on Housing for details of room-and-board accommodations.)

BOOKSTORE

A University Bookstore stocked with textbooks, school, art, and office supplies, collegiate specialties, and other materials needed by students and faculty members is available in Kirby Student Center. The Second Edition, a bookstore annex, provides paperbacks and trade books in a pleasant, browsing atmosphere.

The Bookstore maintains, for student convenience, two plans for the disposing of used books. At the end of each quarter, the Bookstore buys back, for cash, used textbooks that are going to be used the following quarter, within prevailing limitations. The buy-back price is 60 percent of the new book price. The Bookstore also has an exchange plan under which a textbook is left at the Bookstore and when and if the book is sold the student is then paid by check for the book. If the book is not sold, the student gets the book back. Under this plan, the student receives 65 percent of the new book price.

STUDENT ACTIVITIES

Many student organizations and programs are available to those interested in experiences outside of the classroom. They are an important part of the

educational process and students are encouraged to take advantage of these opportunities. There are over 100 recognized student organizations at UMD. They are active in such areas as theater, athletics, debate, religious concern, academic and departmental interest, political and social action, sororities and fraternities, as well as honorary and special recognition groups. A complete listing is available in the current *UMD Trailways* (handbook).

Student Government

Student Association, better known as SA, is the student governing body of UMD. It is a representative system of governance which is open to any student. SA provides an arena where existing University policies may be discussed and new policies recommended to meet the new demands of an ever-changing University. Its cabinet consists of the president, administrative assistant, and three vice presidents. The vice presidents are in charge of academic affairs, business affairs, and student affairs. The elected president and University student senators participate in the UMD Campus Assembly which is the legislative branch of the campus.

Kirby Student Center

Kirby Program Board, with its president elected through all-school elections, represents student interest in programming the social, recreational, educational, and cultural extracurricular activities on campus. The center provides lounges, meeting rooms, food service, recreational areas, and convocation and lecture halls for University programs.

Student Organizations

Where the interest and welfare of students is apparent, special interest groups, governing councils, boards, and committees composed of students, staff, and faculty exist. Recognized student organizations play a vital role in meeting the special interest of students. The University encourages participation in clubs, fraternities, religious organizations, and special interest groups to supplement the students' academic learning. A list of these organizations is available through the student *Trailways* handbook and in the current *Student-Staff Directory*.

Publications

The *Statesman*, a weekly newspaper, is written, edited, and managed by students. Each member of the student body receives the paper. Subscriptions are paid from the student service fee. Once each quarter, the *Statesman* produces a literary issue composed of creative works written by students—poetry, short stories, essays, art, and original compositions. The issue replaces the *Humanist*, former literary magazine.

The *Chronicle*, student yearbook, is a review, chiefly pictorial, of the personalities and activities that have provided highlights of the school year. A student staff edits and manages the publication.

Convocations, Lectures, and Artists Series

Entertainment and the opportunity to extend knowledge and broaden interests are afforded through lectures, concerts, and dramatic performances presented by student, faculty, and authorities well known in their specialized

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fields. In addition to campus opportunities in the area of fine arts, the University Artists Series and the Duluth Symphony Association offers UMD students diverse series of concerts every season. Often these concerts feature noted American or international artists. Season tickets to the regular series are available at special discount rates to UMD students, and are sold spring quarter and again during Welcome Week in the fall. Individual tickets, at a discount rate, are available for each performance on a first-come, first-served, basis.

KUMD-FM

The radio voice of the Duluth Campus, KUMD-FM, serves a variety of local needs and interest. Since support for the station comes from the campus community, the station programs to serve the interests of the students as well as the faculty and general public.

Student Affairs Committee

This is the committee of faculty and students responsible for developing policy and interpreting and enforcing regulations dealing with the nonacademic educational program of the University. It also serves as an appeal body when student organizations feel they have been dealt with unfairly or arbitrarily. A member of the faculty serves as chairman, and the coordinator of student activities serves as administrative secretary.

ATHLETIC AND INTRAMURAL PROGRAMS

The Duluth Campus is a member of the Minnesota Intercollegiate Athletic Conference and the Western Conference Hockey Association.

The varsity sports program includes football, baseball, basketball, hockey, track, swimming, wrestling, golf, skiing, tennis, and cross country.

The Health and Physical Education Building has outstanding facilities. The Duluth Campus has its ski area within a quarter of a mile of the building. Several play fields are in use. Hockey games are played at one of the finest facilities of its kind in the country, the new Duluth Arena. Hard surfaced tennis courts are located on the campus and two fine municipal golf courses are available for use. Football games are played on Griggs Field.

Intramural Sports for Men—The program is continuously expanded into new sports areas as student interest indicates a need and desire. In addition the department will make recreational participation in many activities increasingly available to students not interested in competition. The facilities are kept open and staffed for recreational activities on Saturdays and other free times. Equipment for skiing, tennis, golf, and other game activities are furnished to students on a check-out basis.

Recreational and Intercollegiate Activities for Women—An opportunity for women to participate in a variety of activities is provided by the College Women in Sports program, an association advised by staff members of the Department of Physical Education. All women students are members of CWS and may participate in any of the following programs: recreational activities, intramural sports, club activities, and intercollegiate sports. Open recreation, recreational swimming, and special recreational activities comprise the recreational phase of the CWS program. The following sports opportunities are available under the intramural program: flag football, volleyball, basketball,

broomball, softball, and tennis. Membership in dance and gymnastics club is open to all interested students. CWS holds national, regional, and state affiliation with the Athletic and Recreational Federation of College Women as well as the Minnesota Women's Intercollegiate Athletic Association. This enables CWS to offer a wide variety of intercollegiate sports including field hockey, volleyball, basketball, badminton, tennis, swimming, and track and field. Any of these programs can be expanded into other areas if women students indicate the need or desire. Increasing emphasis will be placed on co-recreational experiences through CWS and intramural programs.

PLACEMENT

The Placement Office in Student Affairs is a centralized placement service established primarily for the purpose of assisting graduates of all departments in obtaining career positions. Full-time students planning to graduate from UMD with a B.A., B.Ac., B.B.A., B.S., A.A., M.A., M.S., or a teaching certificate are eligible for placement registration if they have been, or will be in regular attendance for 3 consecutive academic quarters or 5 summer terms. All registrants pay a \$10 placement records fee. Placement registration is a senior requirement for baccalaureate degree students, and must be completed in the first quarter of the student's senior year. Seniors who do not wish to file credentials must secure a release from the coordinator of placement.

A year-round service is maintained, with concerted efforts being made to bring graduates into contact with prospective employers. Facilities are provided for on-campus interviewing by representatives from school systems, business, industry, and government agencies. Permanent credential files are maintained for registrants, and reactivation of placement registration may be requested by the graduate at any time. The fee for reactivation of credentials and service is \$15. M.A. and M.S. candidates who completed their undergraduate work at UMD may use placement facilities by reactivating their registration. A fee of \$2.50 is charged for forwarding credentials of alumni who are not actively registered for placement.

Vocational counseling as well as consulting services relative to career choice, job opportunities, and occupational trends is provided. This function of the Placement Office is to assist the undergraduate student in planning his career.

Special Educational Opportunities

CONTINUING EDUCATION AND EXTENSION

University-level certificate, degree, and special curricula are available to students in Continuing Education and Extension, Duluth Center programs. Students who plan to use credits earned in these programs for degree purposes must meet curricular requirements of UMD stated in this bulletin.

1. A student must establish contact with his major department or apply for Upper Division standing at the Records Office before beginning work in the Upper Division with a view to graduation.
2. He may be assigned to an Upper Division adviser in his major field by contacting the Orientation and Advisement Office.

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3. He may receive guidance and counseling assistance by contacting the Student Affairs Office.

Residence credit is given for credit program participation.

Persons wishing to receive University of Minnesota Graduate School credit for participation must meet the requirement of admission to the Graduate School or be working toward a graduate degree elsewhere. Students may transfer their graduate or undergraduate grades to the Records Office by requesting the transfer.

For added information and registration contact Continuing Education and Extension, Duluth Center, 431 Administration Building, UMD.

FINE ARTS PROGRAM

Students interested in fine arts may take an active part in theater, band, orchestra, chorus, and chamber music groups.

In the University Theater, students have the opportunity to assist in the production of at least three major plays and to assume fuller production responsibilities in the staging of student productions. Occasional dramatic performances are presented in the community.

The music groups present a regular series of campus concerts and give occasional performances in the community and other cities in the state.

Students are invited to view the art exhibitions at Tweed Museum of Art and to participate in its many functions.

An intercollegiate debate program is available to all students.

HONORS PROGRAMS

Honors seminars are offered when feasible in the Lower Division, and there are frequent special and experimental courses offered by various departments and programs at UMD. These are offered by invitation to students whose achievement records suggest exceptional scholastic or creative ability, but all interested students are urged to investigate these possibilities by consulting current offerings available from the Office of the Vice Provost for Academic Administration. Honors work in the Upper Division is characteristically done under the auspices of the student's major field of study. At present the Departments of Biology, Chemistry, English, History, Music, Philosophy, and Psychology have established special departmental honors programs. These programs use various techniques, such as intensified independent study, departmental honors seminars, senior honors papers, and comprehensive senior examinations. Participation in such programs is based on academic record and invitation. For particulars see the statements in this bulletin in the sections devoted to the Departments of Biology, Chemistry, English, History, Music, Philosophy, and Psychology. Students in all departments are eligible for graduation with special honors. Consult the section in this bulletin on Graduation Honors for further information.

In addition to the more formal honors work that is available, exceptionally able students may choose to accelerate and enrich their studies by means of combining such opportunities as taking courses for credit by examination, enrolling for independent readings courses, working toward multiple majors and minors, auditing courses, and taking maximum loads. Students should consult with their advisers before attempting any of these practices.

STUDENT TUTORIAL PROGRAM

The UMD Student Tutorial Program is a developmental-supportive program in which instructor-counselors and student tutors help interested students develop necessary academic and interpersonal skills as well as confidence in the collegiate setting. Attention is given to career development and community awareness and service. Freshman students who feel they may benefit from this type of program are encouraged to contact STP faculty or student assistants for information. The Human Resources Bank, a student-managed adjunct to STP, provides tutoring for any student on campus as well as in youth-oriented community programs.

SUMMER SESSION

Two 5-week terms of regular University courses are offered each summer on the Duluth Campus. In each term the student may take about half as many credits or courses as in fall, winter, or spring quarter. There are no nonresident restrictions for summer attendance. Tuition is the same for resident and nonresident students.

SUPPORTIVE SERVICES PROGRAM

This program is directed toward meeting the special needs of disadvantaged students. "Disadvantaged" is used in a general context, referring to students who can be described as underprivileged, or who are from culturally distinct backgrounds, or who need assistance in development of academic skills, or who are physically handicapped. The program functions as a focal point for the coordination and development of services and programs designed to meet the diverse needs of these students. Further information on any aspect of the program can be obtained from the Director, Supportive Services Program, 255 Administration Building.

UNIVERSITY COLLEGE

This college includes several semi-autonomous "units" (described below) which currently offer two different bachelors' degree programs, an independent study program, as well as various "service functions." General information about University College is available from the dean's office in 105 Walter Library (373-4638). The primary mission of University College is to promote institutional change within the University of Minnesota.

The Inter-College Program

This program provides a mechanism whereby a U of M student may develop and pursue a cross-college curriculum not available in one of the standard programs of the University schools and colleges. The ICP is only appropriate for those students who know their educational and curriculum needs and who find they cannot achieve their goals without the assistance of the inter-collegiate mechanism. Each program is individually designed and includes an in-depth bulk of Upper Division course work from more than one college within the University. (The ICP offers no courses or prescribed curricula.) Information and application forms are available from University College, 105 Walter Library, Minneapolis Campus.

UC 3-075, Independent Study

This course offers any U of M undergraduate the opportunity to engage in study in an area not covered in normal course offerings. UC 3-075 projects are interdisciplinary and typically involve off-campus resources and experiences. Credits are arranged (3 to 15). UC 3-075 is available to UMD and UMM students, although all students should investigate the possibilities which are available in regular academic departments for doing independent study before proposing work through this registration mechanism. The student has primary responsibility for determining the nature of the project and must be able to clearly state learning goals. He consults with an appropriate faculty member who supervises and evaluates the work. Applications and further information are available from University College, 105 Walter Library, Minneapolis Campus.

The Living-Learning Center

This center provides further opportunity for involvement in interdisciplinary educational experiences. The LLC is a service unit of the University designed to assist students, faculty, and community persons, individually or as small groups, to develop and carry out off-campus field study projects. It supervises such programs as the Teacher Service Corps, etc. Further information is available from Living-Learning Center, 1425 University Avenue S.E., Minneapolis, Minnesota 55414.

Experimental Programs

The University College is currently sponsoring two experimental programs, the University-Without-Walls and the Experimental College. The Experimental College is already approved to offer a Bachelor's degree. For further information, contact University-Without-Walls, 331 Nolte Center, Minneapolis Campus; and Experimental College, 1507 University Avenue S.E., Minneapolis, Minnesota 55414.

Honors

GRADUATION HONORS

Candidates for the baccalaureate degrees who have done outstanding work may be awarded special honors at the completion of the senior year, either through graduation with honors, or through conferral of departmental honors, or through both.

Graduation honors are *cum laude*, *magna cum laude*, or *summa cum laude*. To graduate *cum laude* the student must have a grade point average of at least 3.00 (B) in all work, including transfer credits, in all Upper Division courses calculated separately, and in all UMD work. To attain the higher honors—*magna cum laude* or *summa cum laude*—students must meet qualification levels based on both grade point average and the Area Tests of the Graduate Record Examination. Therefore students who seek the higher honors should make application to the Office of the Vice Provost for Academic Administration at the beginning of the second quarter before graduation or earlier. At that time information regarding special tests and other particulars will be available. These awards apply only to students receiving their first 4-year degree.

Departmental honors are conferred on those graduates who have successfully fulfilled the higher requirements of a special honors program in the department of the major field. (For particulars see the statements in this bulletin in the sections devoted to the Departments of Biology, Chemistry, English, History, Music, Philosophy, and Psychology.)

ACADEMIC HONORS LIST

After each quarter, an Academic Honors List is published. To be listed, students must achieve a 3.25 grade point average or better while carrying 12 credits, excluding courses taken under the P-N grading option. Special recognition is given to students achieving a straight "A" in all courses. Students receiving incompletes or no grade in any course are not listed. P-N grades are not included in computing the 3.25 average.

Scholarships and Awards

SCHOLARSHIPS

Scholarships available to University of Minnesota, Duluth students are listed below with details given in the following order: name of scholarship, name of donor (unless incorporated in name of scholarship), qualifications, selection, and amount per year. In reviewing applications the Committee on Scholarships and Loans considers among other factors, academic aptitude, need, vocational promise, character, and citizenship. Unless otherwise indicated, applications can be obtained from the Financial Aids Office, Administration Building. High school seniors may obtain application forms from their principal, counselor, or senior class adviser. Similarly, transfer students from junior colleges may obtain necessary materials from their dean or counselor. If another date is not listed, applications are to be submitted prior to February 15.

Air Force ROTC College Scholarships—Awarded to qualified 4- and 2-year AFROTC cadets; award is based on applicant's Air Force officer potential as demonstrated on a composite of the Air Force Officer Qualifying Test Score, academic achievement, and recommendation of an AFROTC Scholarship Committee; each scholarship provides for full payment of tuition, laboratory and associated fees, an allowance for textbooks, and includes a tax-free allowance of \$100 each month during the period the student is in school and on scholarship status.

Albright (Ann Colby) Memorial Musical Scholarship—Numerous donors as a memorial to Ann Colby Albright; a deserving music student from northeastern Minnesota with ability in music; apply to Department of Music; amount varies.

Alliss (Charles and Ellora) Educational Foundation Scholarships—Awarded to entering freshmen who are residents of Minnesota and who rank in the upper 40 percent of any class; scholarships applicable on the Duluth, Morris, Minneapolis, and St. Paul Campuses; apply early in senior year; renewable; amounts vary.

Alworth (Marshall H. and Nellie) Memorial Scholarship—Marshall W. Alworth as a memorial to his parents; Minnesota high school or junior college graduates majoring in the natural sciences or medicine; based on need, academic ability, character, perseverance, ambition; apply to Alworth Memorial Fund, 2225 Woodland Avenue, Duluth; deadline March 1; covers tuition, special expenses, living costs according to need; varies from \$400 to \$900 per year.

American Institute of Mining, Metallurgical, and Petroleum Engineers (A.I.M.E.) Scholarship—An outstanding student in geology selected by the department and approved by the UMD Committee on Scholarships and Loans; \$300.

Andresen (G.A.)-Arco Coffee Company Scholarship—Graduate of an accredited high school with a favorable recommendation from high school administrator and an interest in home economics; \$350.

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Art Guild of UMD Scholarship—Available to UMD students majoring in art who have been endorsed by the faculty of the Department of Art; one full-tuition scholarship for each of the two Summer Session art workshops.

Bayer (Robert W.) Memorial Scholarship—Dr. Raymond P. Bayer as a memorial to the late Robert W. Bayer; sophomore, junior, or senior student, unmarried, living away from home, and earning only average grades as a result of financial difficulty who aspires to continue with graduate work in chemistry, physics, or mathematics; \$450 each to two students.

Campbell (J.C.) Scholarship—Recommended graduate of an accredited high school; need is a factor; renewable; \$425; unrestricted.

Delta Kappa Gamma Society Scholarship—Applicant must be a junior or senior woman preparing for the teaching profession; 3.00 GPA or better; \$300.

Duluth Art Institute Summer Scholarship—Available to UMD students majoring in art who have been endorsed by the faculty of the Department of Art; one full-tuition scholarship for each of the two Summer Session art workshops.

Duluth Associated Pharmacists Award—A pre-pharmacy student who has completed at least 2 quarters of work at UMD and is eligible for admission to an accredited college of pharmacy in the United States; \$100 awarded at the beginning of spring quarter; not renewable.

Duluth Association for Retarded Children Scholarship—Must have the necessary certificate for teaching graded elementary pupils and 2 or more years of successful experience; for teachers who wish to qualify for teaching retarded children; \$50 toward meeting Summer Session expense.

Duluth Builders Exchange Scholarship—Graduate of a high school in northern Minnesota who has been recommended by school administrator and who has been admitted to the engineering curriculum; must be a freshman; \$400.

Duluth Business and Professional Women's Club Scholarships—(a) Memorializing Laura A. MacArthur; female graduate of a Duluth public or parochial high school wishing to attend a Duluth college, university, or institution of equivalent post-high school professional training; \$500. (b) Memorializing Ray L. Leland; female graduate of a Duluth public or parochial high school, enrolled or qualified for admission at UMD; nominations by the UMD Committee on Scholarships and Loans subject to approval by the sponsor; \$500; renewable.

Duluth Campus Scholarships—Numerous donors; based on need, scholarship, character, and vocational promise; awards vary.

Duluth Chapter, Minnesota Society of Certified Public Accountants Accounting Scholarship—Accounting major; see Accounting Department for information; \$100.

Duluth Engineers Club Scholarships—Graduates of a public or parochial high school who plan to enroll or are enrolled in engineering at UMD; two at \$250 each.

Duluth Lions Club Scholarship—Awarded to a freshman who is a resident of Minnesota with preference given to the Duluth area; must be eligible for admission and be recommended by high school administrator; renewable; up to \$500.

Duluth-Superior Chapter, Society of Senior Real Estate Appraisers Scholarship—Upper Division student at UMD majoring in business administration; from northeastern Minnesota; \$375.

Dwan (John C.) Educational Foundation Scholarships—Mrs. John C. Dwan as a memorial to her husband; graduates of any public, parochial, or private high school within 40 miles of Duluth; may major in any course of study in any accredited college or university; based on character, college aptitude, a record of serious study, and financial need; apply to Financial Aids, 139 Administration Building, UMD; amounts vary.

Edson (Martha Corneille) Scholarship—Relatives and friends as a memorial to Martha Corneille Edson; students enrolled in the Department of Music; scholastic achievement in areas outside of music, talent in musical performance, and deserving need; apply to Department of Music or Student Affairs; \$100.

Employers Industrial Relations Council Scholarship—Graduate of any accredited high school in the United States who is enrolled or who has been approved for admission to UMD; nominations by the UMD Committee on Scholarships and Loans subject to approval by the sponsors; \$600.

Ernst and Ernst Accounting Scholarship—Supported by the sponsoring company for a senior student who demonstrates academic excellence, character, and leadership in University life; applicants contact Department of Business Administration during junior year; \$200.

- First American National Bank Scholarship*—Must be a member of the junior or senior class at UMD with a major in business and economics; Duluth resident preferred; \$450.
- Flament-Hampshire, Inc., Company Scholarship*—Graduate of a northeastern Minnesota high school admitted to the engineering curriculum; \$300.
- Foreign Student Tuition Scholarships*—Foreign students who show exceptional promise for success; applications must be made well in advance of expected dates of attendance; see Foreign Student Adviser, Counseling Office, UMD; full nonresident tuition.
- Grady (Armistead) Scholarship*—Duluth Kiwanis Club as a memorial to Armistead Grady; high school or junior college graduate; \$450.
- Heitmann (John and Minnie) Scholarship*—Graduate of any accredited high school eligible for admission to UMD; selection based on scholarship, need, character, and vocational promise; award varies.
- Helstrom (Hilbert O.) Memorial Scholarships*—Mr. and Mrs. Jon Helstrom, honoring Mr. Helstrom's father; students regularly enrolled at UMD in any academic program who are living away from home; need is a factor; preference is given to young people from a minority group; two at \$300 each; renewable.
- Helwig (Clara A.) Scholarships*—Young people of St. Louis County who are or will become students at UMD; awards, based on interest earned by the bequest, must be equally divided between two men and two women; cannot own a car; need is a factor; must be going into teaching field; \$250 each.
- Hunt (James Wright) Scholarships*—Graduates of any Duluth public high school; based on outstanding character and scholarship; apply to Executive Secretary, J. W. Hunt Scholarship Fund, 2215 East Fifth Street, Duluth; deadline March 1; \$330-\$800 per year.
- Kendall (Margaret Houlton) Scholarships*—Awarded to entering female freshmen at UMD who are residents of Minnesota and who rank in the upper one-fourth of their high school graduating class; amounts vary.
- Lakehead Pipe Line Company*—(a) Scholarships for the employees' children are selected by the sponsoring company; apply to the company, 3025 Tower Avenue, Superior, Wisconsin; \$700 per year for a maximum of 4 years or until a degree is received. (b) A substantial annual grant from this company to the UMD Scholarship and Loan Committee to be used in assisting worthy, needy, and well-qualified students who require financial aid in order to initiate or continue an educational program; apply at Financial Aids Office; amounts vary.
- Lyon (Howard W.) Foundation Scholarships*—Limited to art majors at UMD endorsed by the faculty of the Department of Art; recommended by administrators of previous schools attended; \$250-\$500.
- Mannering Fund Music Scholarships*—For music students; based on need, character, scholarship, and vocational promise; see Music Department; amount varies.
- Marsh (Clarissa Walton) Scholarship*—The Reverend Lucien J. Marsh in memory of his wife; worthy and needy high school graduate who has been admitted to UMD; amount varies depending on earnings of the fund.
- Matinee Musicale of Duluth Scholarships*—Residents of Duluth enrolled in the Department of Music; based on talent, ability, and deserving need; apply to Department of Music; \$100.
- Melander-Fugelso and Associates Scholarship*—Graduate of any accredited high school in the United States enrolled or approved for admission to UMD; recipient must be an individual who has shown industry, leadership, motivation, and career potential through participation in off-campus work activities and/or involvement in student life and organizations at UMD; a male from this area preferred; \$400.
- Merriam (Josephine L.) Scholarships*—Male freshmen, residents of Minnesota, northern Wisconsin, or the Upper Peninsula of Michigan; recommended by administrator of previous school attended; admitted to engineering with primary interest in electrical engineering; \$300.
- Minnesota Power and Light Company Scholarship*—Available to a qualified graduate of any accredited high school in the service area of the sponsoring company whose educational opportunities will be bettered through financial assistance; \$600.
- Minnesota State Scholarships and Grants*—All entering freshmen from Minnesota should contact Mr. Bart Kersteter, Scholarship Officer, Minnesota Higher Education Coordinating Commission, Suite 400, Capitol Square, 550 Cedar Street, St. Paul, Minnesota (55101) for application and information.

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Minority Scholarship Fund—Nominations made by the Student Association with final action by the UMD Committee on Scholarships and Loans; preference will be given to an individual from a minority group; amount varies depending upon allocations from SOS Week project.

North Star Grants-in-Aid—Various donors; high school graduates; recommended by secondary school principal; based on academic ability, need, citizenship, character, and participation in extracurricular activities with emphasis on athletics as may be directed by donor; amounts vary.

Noyes (LaVerne) Scholarships—Direct blood descendants of World War I veterans who were in the service 6 months before the Armistice, and who have completed 2 quarters of satisfactory work at the University; application and discharge papers must be filed each quarter before September 1, December 1, and March 1; grants limited to a maximum of 6 quarters.

Radford Company Scholarships—Awards are based on academic achievement, need, character, citizenship, and vocational promise; must be from their service area; 5 awards; amounts vary.

Ridder (Victor F.) Scholarship—WDSM radio and TV as a memorial to Victor F. Ridder; qualified high school graduate whose educational opportunities will be bettered through financial assistance; \$250-\$1,000.

Roberts (Hugh M.) Scholarship—Major in geology who has proven ability to do high quality collegiate work providing there is known need for financial assistance; selection by the Geology Department with approval by the UMD Committee on Scholarships and Loans; \$300; renewable.

Roberts (Katherine M.) Memorial Scholarship—Speech pathology majors; nominations by the department with approval of the UMD Committee on Scholarships and Loans; \$200-\$300 depending on accumulated interest in fund.

Rotary Club of Duluth Scholarships—Awarded to residents or nonresidents of Minnesota; must be eligible for admission to UMD and recommended by administrators of previous schools attended; three at \$500 each.

Scottish Rite Scholarship—Provided by the four constituent bodies of the Ancient and Accepted Scottish Rite of the Valley of Duluth to a needy, worthy, and competent high school graduate who has been admitted or is eligible for admission to UMD; selections are made on an annual basis by a committee of the Scottish Rite organization and application should be made to the Scottish Rite Bodies, Masonic Temple, Duluth; awards vary from \$300-\$500 depending on the place of residence of the recipient.

Soneson (Walter and Anna) Scholarships—Awarded to Duluth public high school graduates of the Protestant faith who have been residents of Duluth at least 3 years before high school graduation; based on reasonable need; apply through high school principal; deadline March 1; varies from \$200-\$1,000.

Sons of Norway Scholarship—Qualified high school graduate from Duluth, Superior, Cloquet, International Falls, Hibbing, Virginia, or Two Harbors who has been admitted to UMD; \$250.

Stewart (Clan) #50 of Duluth Scholarships—Available to UMD students in need of financial assistance; preference given to entering freshmen; amount varies depending on earnings of the fund.

St. Germain Brothers, Inc., Scholarship—Ability to do college work; financial need is a factor; \$200; renewable.

St. Louis County Federal Savings and Loan Association Scholarship—Resident or nonresident high school graduate qualified for university admission and recommended by principal or counselor; \$400.

State Indian Scholarships—Available to any student who has one-fourth or more Indian blood, resident of Minnesota; accepted by an accredited college for advanced specialized education or a business, technical, or vocational school; apply to Mr. Edwin F. Mittelholtz, Guidance Consultant, Indian Education, Minnesota Building, 410 Minnesota Avenue, Bemidji, Minnesota; amounts vary.

Student Association Scholarship—Student must maintain average GPA minimum of 2.00, maximum of 3.25; must have applied for financial aids through the Financial Aids Office; Student Association approves recommendations from the Scholarship and Loan Committee; five awards granted each year; amount varies.

Thompson (Toltof) Scholarship—Student from Duluth who is entering or has entered UMD; income from original bequest, approximately \$300.

- Tuohy (Alice Lyon Tweed) Foundation Scholarships*—Available to UMD students majoring in art who have been endorsed by the faculty of the Department of Art and administrators of previous schools attended; \$250-\$500.
- United Northern Sportsmen Scholarship*—United Northern Sportsmen of Duluth; Minnesota high school graduate having indicated an interest in the field of conservation, intending to major in biology, wildlife management, or aquatic biology; \$300.
- United Steelworkers of America Scholarships*—Locals 1424 (Duluth), 4108 (Aurora), 4757 (Babbitt) and 5296 (Silver Bay) each support a scholarship usable at an accredited institution; sons or daughters of members are eligible for selection; applications handled by a local committee; amount varies.
- United Steelworkers of America Scholarships*—United Steelworkers of America, Local 1028; recommended by secondary school administrator; parents must be member of Local 1028; \$350; renewable.
- University of Minnesota, Duluth Bookstore Scholarships*—Awarded to students enrolled at UMD; based on need, scholarship, character, and vocational promise; awards vary.
- University of Minnesota Memorial Fund Scholarship*—From various donors honoring deceased faculty members of the University and/or their families; student of high academic promise who needs financial assistance; preference to children of faculty or staff members who have passed away during or since their time of service; award varies but usually approximately \$100 per quarter.
- Voss (Gordon O.) Scholarship*—From various donors honoring the late head of the Industrial Education Department at UMD; sophomore, junior, or senior majoring in industrial education approved by the department; need is a factor; awards will be approximately \$200-\$300 depending on funds available.

AWARDS

Awards available to students at the University of Minnesota, Duluth are listed below with details given in the following order: name of award, name of donor, qualifications, selection, amount, evaluating group.

- Alice Tweed Tuohy Art Awards*—Howard W. Lyon; purchase awards may be made annually of original works of art submitted by students, chosen by the faculty of the Department of Art from the following categories: painting, sculpture, prints, ceramics, or crafts.
- E. W. Bohannon Scholarship and Loan Fund*—Faculty and alumni of the Duluth State Teachers College and others; limited to regularly enrolled students at the University of Minnesota, Duluth; based on scholarship and character; interest on a sum of about \$4,800; selection based on recommendation of the faculty.
- Francis H. DeGroat Memorial Award*—Mrs. Mary DeGroat; sophomore, junior, or senior student at UMD; based on the best essay within the broad topic of "Man's Struggle for Freedom"; \$50 each academic year; apply to head of the Department of Political Science, or to director of Student Affairs.
- George H. Primmer Award*—Gamma Theta Upsilon, geography fraternity; graduating students at UMD majoring in geography; based on highest academic average in geography courses; approximately \$25 per year; head of the Department of Geography.
- Regents' Student Aid Fund*—Attendance at UMD as a full-time student or eligible for admission; based primarily on financial need, but must be eligible to continue in a degree program; priority given to the most needy students.
- S. H. Somsen Award*—Attendance at UMD as a full-time student; based on individual worth and need; income from the original bequest of \$1,000; faculty committee.
- J. L. Washburn Memorial Award*—Faculty and alumni of the Duluth State Teachers College and others; graduating students majoring in American history; based on the highest academic standing in this subject; income from the original bequest, usually about \$50 per year; faculty committee.
- Robert A. Vickers Memorial Music Award*—Dr. David A. Vose and other donors; an outstanding instrumental musician; approximately \$100 per year; departmental recommendations.
- Elva C. Moore Memorial Award*—Dr. Francis B. Moore and other donors; an outstanding major in home economics with preference to a third-quarter junior; \$50 per year; departmental recommendations.
- 3-M Scholarship Award*—Presented to the outstanding junior chemistry major; \$250; faculty of the Chemistry Department.

Loan Funds

Loans available to students at the University of Minnesota, Duluth are listed below. Unless otherwise indicated, information and applications can be obtained in the Financial Aids Office, Administration Building.

Employees Student Loan Fund—Based on an original allocation of \$5,000 transferred to the campus by the Regents in 1948, a fund has been established to provide loan service to students attending the University of Minnesota, Duluth. To be eligible, students must have attended the University of Minnesota at least 2 quarters and be making satisfactory progress toward a degree. Loans carry an interest rate of 3 percent while the student is attending UMD and 6 percent following graduation. Maximum period for repayment is 1 year. Applicants must meet specific requirements including the ability to demonstrate that continued attendance at the University would be impossible without the assistance requested.

Duluth Student Loan Fund—Through the generosity of patrons of the Duluth Junior College, funds to be used for loan purposes were turned over to UMD when the former institution was closed in 1950. Students who qualify under the terms summarized in the paragraph immediately above (*Employees Student Loan Fund*) are eligible to apply for assistance from this fund.

Student Emergency Loan Fund—Through a gift from the late J. D. Mahoney, supplemented by other contributions and memorials, a loan fund has been established permitting small loans for short periods at a minimum interest rate.

National Defense Education Act Loans—Students in good standing regardless of academic field are eligible. Loans may be made in amounts up to \$1,000 per school year for undergraduates depending on financial need. The maximum loan for graduate students is \$1,500 per year. Financial need is determined by College Scholarship Service and local review, and is a primary and essential factor. Application for NDEA assistance must be submitted by February 15 for the academic year beginning in September. Requests for Summer Session loans are contingent on the availability of monies. Inquiries regarding Summer Session loans can be made during the month of May of each academic year.

Duluth Engineers Club Emergency Loan Fund—The Duluth Engineers Club has established an Emergency Loan Fund available to students majoring in any phase of science to help meet unexpected financial problems. Loans can be made in limited amounts for a short period of time at a minimum interest rate.

Ezra H. Pieper Emergency Loan Fund—Through a gift from friends, associates, and former students of the late Professor Ezra H. Pieper a loan fund for students accepted to a major in any of the fields of study in the Division of Social Sciences has been established. Limited amounts at a minimum interest rate are available for short periods of time.

Harold A. Stueland Memorial Loan Fund—Through a gift from friends of the late Professor Harold A. Stueland a loan fund for art students has been established permitting small loans for short periods of time at a minimum interest rate.

E. W. Bohannon Scholarship and Loan Fund—An applicant shall have been in attendance at the University of Minnesota, Duluth at least 1 quarter. No student may borrow more than \$150 during a college year of 3 quarters. All loans shall bear interest at the rate of 4 percent. Applications are referred to the financial agent, who submits each request to the board of directors for consideration.

Gregg Johnson Music Loan Fund—Established by Mrs. Myrtle Hobbs Johnson, former UMD faculty member, as a memorial to her son. Loans from this fund are available at a minimum interest rate to qualified students who are majoring in the Department of Music.

Dr. LeRoy Edson Doolittle Memorial Loan Fund—Established by Mrs. L. E. Doolittle as a memorial to her husband. Loans are available from this fund to premedical students with preference to those planning to specialize in pediatrics. The interest rate is 3 percent while the borrower is in school and 6 percent after graduation.

Electrical Workers and Contractors Loan Fund—Established for students enrolled or admitted to the University of Minnesota, Duluth. The donors are the International Brotherhood of Electrical Workers Local 31 and Twin Ports Chapter of National Electrical Contractors Association. Limited amounts at a minimum interest rate are available for short periods of time.

Alumni Association

The UMD Alumni Association is now an independent organization apart from the University of Minnesota Alumni Association.

Membership is open to graduates of UMD, Duluth State Teachers College, and Duluth State Normal School. Patron memberships are also open to non-UMD graduates.

Activities include a Campus Preview each spring for high school juniors in the top 5 percent of their class, social activities for alumni after athletic events, and annual meeting and programs which further campus-community relations.

Alumni also receive a quarterly publication of campus and alumni news.

CAMPUS REQUIREMENTS

Admissions Information

GENERAL

The charter of the University of Minnesota charges each college faculty with the responsibility of establishing and maintaining standards of admission. The faculty of the University of Minnesota, Duluth has accordingly established a selective admissions policy in which each applicant's record of achievement and measured aptitude for collegiate level work is examined. When it appears necessary or advisable, additional personal information may be requested through school officials or by direct contact with the applicant, his parents, or other appropriate references.

Application materials should be filed by the dates suggested, or consideration for a subsequent term or year may be necessary. A check or money order in the amount of \$10 made payable to the University of Minnesota, Duluth must accompany each application. This is a "credentials examination fee" and is not refundable.

Persons wishing additional information or assistance are encouraged to contact the Admissions Office, the Counseling Office, the Graduate School, or the appropriate professional program office on the Duluth Campus. Applications for admissions, housing, and financial assistance are separate and students should follow up on each by contact with the appropriate offices. Acceptance for admission to the University does not assure housing accommodations.

FRESHMEN

(See Nonresident Section, if appropriate)

Applications are available from Minnesota high schools and the Admissions Office. Early application is encouraged. Final filing dates are July 15 (fall quarter), November 15 (winter quarter), February 15 (spring quarter).

Freshmen who are interested in beginning in the Summer Session see section on Summer Session, page 30.

All applicants are required to take the American College Tests. Dates of administration and fees are announced to the high schools and colleges annually.

Minnesota resident applicants need to have a high school diploma or similar background and are required to have a CAR (college aptitude rating) of 40 or the equivalent probability of success. The CAR is the average of a student's high school percentile rank and his percentile rank on a college aptitude test (e.g., the Minnesota Scholastic Aptitude Test). Students from the UMD service area (contiguous areas in which other appropriate opportunities are not available) who do not meet these requirements will be admitted on a selective basis. Minority students who are residents of Minnesota will be considered to be within our service area. Such individuals will be asked to participate in an academic assessment program.

Outstanding high school students may be considered for admission prior to graduation (usually at the end of the junior year). Special interviews, recommendations, and tests are usually required.

ADVANCED STANDING

(See Nonresident Section, if appropriate)

Applications for admission for students who have completed 39 or more quarter credits are available from the Admissions Office and should be filed by July 15 (fall quarter), November 15 (winter quarter), February 15 (spring quarter). The \$10 credentials examination fee is required. All official transcripts from each institution attended must be filed. Failure to do so is a violation of University regulations, subject to review by the Student Behavior Committee. Duplicate work taken as a result of not reporting previous work cannot be applied toward degree requirements. Students who have completed less than a year at another institution will usually find it advantageous to complete the full year before considering transfer. However, such persons may be considered for admission as freshmen by submitting transcripts for work completed as well as freshman application information. (See Freshmen admission section)

To be eligible for admission, a resident advanced standing applicant should have a cumulative grade point average of 2.00 (C) or its equivalent.

As a part of acceptance, work taken at previous colleges will be evaluated for transferability and applicability. This information will assist in course choices for registration. (See Transfer of Credit [page 38] for additional information.)

SPECIAL STUDENTS

Persons who have particular course interests but who are not candidates for a degree may apply for admission as a "special" student. Although complete credentials are not usually required, transcripts or tests may be requested in individual cases. Usually special students are expected to be residents of the area. Continuation beyond 1 quarter is at the discretion of the Scholastic Committee.

Applications should be filed by September 15 (fall quarter), November 15 (winter quarter), February 15 (spring quarter). The \$10 credentials examination fee is required.

The following situations are included in this category:

1. Well qualified high school seniors who, with the recommendation of the high school counselor (or principal) and the student's parents, can be considered for concurrent college and high school registration.
2. Persons who have not completed high school and who wish to try

a limited amount of work (usually a maximum of 6 credits for the first quarter).

3. The high school graduate who is not intending to work toward a degree.

4. Persons who have completed a Bachelor's degree or higher, who have not been admitted to Graduate School, or who wish to upgrade their basic preparation. Only the first quarter of such work is later applicable to a graduate program.

GRADUATE SCHOOL

Any student with the Bachelor's degree or its equivalent from a recognized college or university may seek admission to the Graduate School. Programs for the master of arts degree are offered in art, education, educational administration, educational psychology (school counseling), English, history, and speech pathology. Programs for the master of science degree are offered in biology, botany, chemistry, geology, physics, and zoology. The Specialist Certificate Program in elementary, secondary, or general school administration also is available. A completed application for admission must be received at least 4 weeks prior to the quarter or Summer Session in which a student expects to register. Additional information is available through the Assistant Dean, Graduate School, 403 Administration Building, University of Minnesota, Duluth. (See page 188 of this bulletin)

SCHOOL OF MEDICINE—DULUTH

(See separate bulletin)

Residents of Minnesota are given primary consideration for admission while secondary priority is given to applicants from northern Wisconsin and the Upper Peninsula of Michigan. Applications from outside of these areas will not be considered. Strong consideration is given to those applicants who will have received a Bachelor's degree before entering medical school. Application from college juniors who will have completed 135 quarter hours (90 semester hours) of college course work prior to entry are considered but not encouraged.

The Committee on Admissions considers that two of the most significant qualifications that an applicant can present are (1) a demonstrated capacity for excellence in scholarship in an academic discipline of his own choice, and (2) personal and background traits that indicate a high potential for becoming a family physician. Sex, race, religion, or national origin are not factors in determining eligibility for admission.

Applications for the 1973 entering class will be accepted from June 1, 1972 to November 15, 1972; similar dates will apply to subsequent classes. Requirements for application are the completion of the 1972 Medical College Admission test or results from any previous test taken during the past 2 years, completion of most prerequisite courses, and being available for a possible personal interview in Duluth from June to December 1972. Prospective applicants who need a bulletin or additional information may address inquiries to Assistant Dean, School of Medicine—Duluth, University of Minnesota, Duluth, Duluth, Minnesota 55812.

DENTAL HYGIENE PROGRAM

Admission procedures are twofold. To be considered for the Dental Hygiene Program an applicant must (1) satisfy requirements for admission

to UMD as a freshman or advanced standing student, and (2) apply directly to the Dental Hygiene Office, 413 Administration Building, UMD, for admission to the program. Each applicant will be notified of acceptance to the Dental Hygiene Program separately from admission to UMD. The Dental Hygiene Aptitude Test is also required of all applicants. Candidates should plan to take the test in the year preceding desired entrance. The February test date is the latest date for which results can be received by the Dental Hygiene Office for admission to the fall class.

A high school diploma whose curriculum includes courses in chemistry, biology, and mathematics is a necessary prerequisite to eligibility. The applicant should rank in the upper 25 percent of his class. Students with previous college experience will be evaluated on the basis of their college performance. Priority will be given to fully qualified regional applicants. A class of 16 will be enrolled each September.

SCHOOL OF SOCIAL WORK—DULUTH

Prospective students must meet the University of Minnesota Graduate School admissions requirements, as well as those of the School of Social Work (see UMD calendar for application and registration dates). There will be provision for advanced standing admission of persons who have completed an undergraduate program in social work which is certified by the Council on Social Work Education. Applicants may also request waiver of some course requirements for the MSW degree if they have been full-time employees of social service agencies for at least 2 years.

Prospective applicants who wish additional information should address inquiries to Director, School of Social Work—Duluth, 2627 East 7th Street, Duluth, Minnesota 55812.

SUMMER SESSION

(See separate *Summer Session Bulletin*)

The Summer Session is open to all persons regardless of whether or not they qualify for admission to a regular academic quarter. The \$10 credentials examination fee is not required and usual freshman or advanced standing admission criteria and application procedures do not apply. However, a student who wishes to continue into the next regular academic quarter must be admitted as a regular student, meeting the filing dates and other requirements as described previously in this section (see pages 27-28 for Freshmen and page 28 for Advanced Standing requirements).

There are no resident restrictions during the summer and the same fee schedule pertains to all students.

Bulletins are usually available after April 1. The bulletin contains pre-registration forms and outlines procedures as well as course offerings. Students are not required to come to the campus until the day before classes begin. For additional information regarding admission and registration procedures, write to Director of Summer Session, 410 Administration Building, University of Minnesota, Duluth, Duluth, Minnesota 55812.

RETURNING STUDENTS

A student who was previously enrolled at UMD (exclusive of Summer Sessions) and who was in good academic standing when he left, may re-enroll by filling out the "Intent to Reenroll Form" in the Admissions Office.

This can be done at any time preceding registration. Transcripts of all college-level work completed since last attendance (including work taken in Continuing Education and Extension) must also be submitted.

A previously enrolled student who was not in good standing when he left, must submit a petition to the appropriate committee in addition to the "Intent to Reenroll Form." Petitions to the Scholastic Committee should be filed by July 15 (fall quarter), November 15 (winter quarter), and February 15 (spring quarter) and must be accompanied by a transcript of all college-level work completed since last attendance at UMD.

A student who has been dismissed for academic reasons may be readmitted with a provisional stipulation. He may be dismissed again if the stipulation is not met.

STUDENTS TRANSFERRING WITHIN THE UNIVERSITY

Students who wish to process a request for transfer from one college or campus of the University to another must secure the appropriate form from the Admissions Office, complete and return it to the Records Office of the campus from which he is transferring. No additional fee is required. Students considering this type of transfer should consult the bulletin of the college or campus to which they anticipate transfer for application deadline dates and additional admission criteria. Admission to a preprofessional curriculum does not assure transferability to the professional school at a later date nor does admission to one program, college, or campus assure admission to others; each of the various programs and units determines its individual eligibility requirements.

NONRESIDENTS

(Including Foreign Students)

An applicant's residence status under University Residence Regulations is first determined at the time of application (see page 34 for additional information on regulations). Except for a few special instances (related to persons who live in Minnesota but who have not yet acquired University residence), all regular undergraduate out-of-state applicants are expected to meet more stringent entrance requirements than those required for residents as well as to pay higher fees.

Under provisions of a compact between the Minnesota and Wisconsin higher education coordinating commissions, Wisconsin residents are eligible to apply to the Minnesota commission for the privilege of admission under the Freshman or Advanced Standing resident admission policy and of payment of resident fees. The reciprocity agreement also is open to Minnesota residents who may wish to attend a Wisconsin college, university, or vocational school. For further details, students should consult their high school counselor or the Admissions Office at UMD.

The categories for which residence status has relevance are listed below:

1. *Freshmen* should be in the upper half of their graduating class and should have better-than-average test scores as compared with college-going students in general. While all applicants must take the ACT tests, when sufficient information is available admission decisions can be made using CEEB or other tests. Additional information pertaining to all applicants is included in the sections on General Admission Information and on Freshmen.

Section 1

2. *Advanced standing* applicants are required to have a cumulative grade point average of 2.60 (C=2.00) or equivalent probability of success to be considered (see section on Advanced Standing Admission also).
3. *Applicants from other countries* are considered on an individual basis with consideration given to the academic record of each student in relation to the educational system of his native country. Students applying must show evidence of exceptional academic achievement and probability of success at UMD. The "Test of English as a Foreign Language" (TOEFL) is required of all students applying from outside the United States if the applicant's native language is not English. Letters of reference from individuals under whom the applicant has studied and evidence of good health are required.

The TOEFL test is offered world-wide at selected locations. Students who cannot obtain a *TOEFL Bulletin of Information for Candidates, International Edition* and registration forms locally should write for them well in advance to Test of English as a Foreign Language, Box 899, Princeton, New Jersey 08540 U.S.A.

For information and the requirements for Graduate School admission, students should write to Assistant Dean of the Graduate School, 403 Administration Building, University of Minnesota, Duluth, Duluth, Minnesota 55812.

The University has a limited number of foreign student tuition scholarships which are awarded competitively. Under no circumstances is the University in a position to provide assistance with board and room.

4. *Canadian Students* with a diploma from a provincial high school must have a cumulative grade point average of 2.50 in the 4 years leading to completion of the junior matriculation in order to qualify for admission as a freshman. The following scale is used to convert scores to the grade point system:

100 - 76	= A	= 4 grade points
75 - 60	= B	= 3 grade points
59 - 54	= C	= 2 grade points
53 - 50	= D	= 1 grade point
Below 50	= F	= 0 grade points

Canadians seeking admission at the junior matriculation level must take the American College Tests (ACT). For registration materials and additional information about the test, write to Registration Department, American College Testing Program, P.O. Box 414, Iowa City, Iowa 52240. The test is administered several times and at various locations throughout Canada each year. If taking the test causes special hardship due to the location of the test center, please advise the Admissions Office of this fact and other arrangements will be made, if possible.

A maximum of 45 quarter-hour credits can be granted for course work completed at the senior matriculation level. The total number of credits allowed is determined by the content and quality of the student's work.

Costs and Fees

COST OF ATTENDANCE

A general estimate of cost of attendance for a resident of Minnesota is about \$2,400 per year if living in a dormitory. This figure must be qualified because many students are able to live at home, carry lunches, or otherwise economize on board and room, the largest and most flexible item in a student's annual expense. Costs outlined in the following sections are fixed and can provide a basis for an estimate of the cost of attending college. Students wishing advisement in financial matters are urged to consult the Financial Aids Office, 139 Administration Building.

FEES

All University fees are subject to modification by the Board of Regents.

Tuition

	Quarter Fee		Credit Hour Fee	
	Resident	Nonresident	Resident	Nonresident
Undergraduates	\$168.00	\$470.00	\$14.00	\$39.25
Graduate School Students				
More than 6 credits	200.00	505.00	No credit hour fee provided	
6 credits or less, or two courses				
or less, or thesis only ..	100.00	253.00	No credit hour fee provided	

SPECIAL RESIDENT FEE PRIVILEGES

New full-time faculty members with rank of instructor or above, civil service personnel eligible for faculty group insurance, and certain accredited foreign diplomatic officials and their immediate families may pay resident fees in all colleges. Similar provision, 1 year after their arrival, is made for military personnel on duty in Minnesota for other than college attendance. New full-time faculty on the staff of accredited Minnesota colleges (not their families) have the same privilege as provided for new University faculty. Persons for whom these provisions are meaningful should contact the Records Office to make appropriate arrangements.

Graduate students of certain classifications who are giving 25 percent or more of full-time service to the University and their immediate families are privileged to pay tuition at the Graduate School resident rate, regardless of source of fund, resident status, or curriculum pursued. Those included are fellows, scholars, assistants, instructors, research associates, and members of the teaching staff and scientific bureaus and experiment stations; they must be regularly enrolled in the Graduate School or be in the final year of the Master's degree curricula in undergraduate colleges.

Civil service appointees working 75 percent time or more are eligible for the same privilege. This privilege does not extend to members of the immediate families of such appointees.

Faculty members at the postdoctoral level may audit courses without registration or payment of fees. Should the need arise, an official class audit card may be obtained from the Graduate School.

Residence counselors with Bachelors' degrees are privileged to pay tuition at the resident rate of the college in which they are enrolled.

Section I

NONRESIDENT STUDENTS

Nonresident tuition fees will be charged students who have not had permanent homes in Minnesota for at least a calendar year. The completion of a year's stay in Minnesota does not in and of itself establish residence for University purposes; a person who moves to Minnesota coincident with attending school may not be able to demonstrate that he is acquiring Minnesota residence.

The student from out of state who proposes to establish residence must assume the burden of proving conclusively that he has been a resident the required time and intends to make his permanent home in the state.

Although the student's classification may be changed whenever all necessary residence requirements are met, it is his responsibility to initiate action. If there is any question about his classification, resident or nonresident, he should apply to the Admissions Office for consideration of his status. For Special Resident Fee Privileges, see bulletin page 33.

Student Service Fee

The student service fee for undergraduates and graduates is \$34 per quarter.

All students registered for 6 credits or more in any quarter are required to pay the student service fee. The student service fee is required of all students in the Graduate School, except (a) public, parochial, and private school teachers in service who are full-time elementary or secondary teachers taking *less than 6 credits*** and (b) students living beyond the commuting area doing research away from the campus whose registration is only for starred papers, for purposes of consultation with their major adviser by mail, or by occasional visits to the campus. Any student (students in extension excepted) for whom the student service fee is not required may obtain the privileges by paying the fee on an optional basis. For such students the student service fee will be charged on request.

Student Activities Card—All students who pay the student service fee shall receive a Student Activities Card which, when presented together with the Student Identification Card, shall entitle them to the benefits supported from student service fee income: athletic events, theater productions, health service, convocations and lectures, and other services.

Married students may purchase a Student's Athletic-Theater-Convocation Ticket each quarter for \$8.40. This card will admit the spouse to inter-collegiate athletic events, theater productions, and convocations and lectures having controlled admission.

Student Identification Card—Each student is issued a plastic Student Identification Card at the time of his first registration in the University. The card bears the student's name, student file number, and photograph, and is a permanent card to be used during the time the student attends the University. The Student Identification Card is intended to reserve to the student the rights which are only a student's. The card should be in a student's possession at all times and will be necessary to receive various University services and to register in subsequent quarters of attendance. The replacement charge for a lost or damaged card is \$4.

** This exception does not apply to University faculty and civil service personnel.

Student Hospital Insurance Fee

The student hospital insurance fee is \$13.70 per quarter for single coverage and \$78.90 for family coverage for married students (subject to annual change).

Students already covered by adequate hospitalization insurance may be exempted from this fee by completing a Request for Exemption card and having it approved at registration. Students taking less than 6 credits are not required to pay this fee but may elect to take the coverage on an optional basis. Payment of this fee entitles a student to Blue Cross hospitalization and Blue Shield medical-surgical insurance policies paying all except \$2 per day for a multiple-bed hospital room. Coverage is available on an optional basis whether or not enrolled during the summer months if paid for at the cashier's window before June 1.

Special Fees

Undergraduate Credentials Examination Fee (for all except summer-only and Continuing Education and Extension students)	\$10.00
Graduate Credentials Examination Fee	15.00
Special Examination Fee	20.00
Special Laboratory Course Fee (per quarter)	4.00
Graduation Fee (including small diploma)	10.00
Graduation Fee (including large diploma)	17.50
Duplicate Diploma Fee	10.00
Large	7.50
Small	1.00
Duplicate Fee Statement	10.00
Placement Service Fee (required of all registrants)25 or .50
Lockers, small or large (refundable padlock deposit also required) (per quarter)	5.00
Parking Decal (per quarter)	1.00
Record Service Fee (transcript)	
Late Fee (for late registration or late payment of fees)	
Through first week of classes, except Graduate School students and teachers in service	6.00
Through second week of classes	10.00
Third week of classes and thereafter	20.00
The following courses require payment of fees as indicated:	
Music Lesson Fees—List of courses requiring this fee is furnished with registration materials. 10 half-hour lessons each quarter	30.00
(This fee is waived for students with an approved major in music, so long as they remain in good standing and until they have completed the required number of credits in applied music. This waiver applies only to fall, winter, and spring quarters.)	
Physical Education—A towel and equipment fee of \$2.00 per quarter will be charged for all activity courses (only one fee required if student is registered for more than one activity course) except as shown below:	
PE 1-003 and 1-048—\$7 per quarter and PE 1-057—\$5 per quarter in place of towel and equipment fee	

Deposits

Art—For material cards for all art studio courses, except Art 1-002, 1-010, 1-011, 1-100, 3-710, 3-711, and 3-712	5.00
Chemistry—For breakage card	10.00
Industrial Education—Minimum for a materials card for all laboratory courses	3.00

REFUNDS

If registration is canceled before 6 weeks of any quarter have passed, a student is entitled to refund of tuition, student service fee, and course fees on the following basis: if Student Affairs office certifies that the student has not attended any classes, a full refund is made; if the student officially cancels within the first week, a 90 percent refund is made; within the second week, 80 percent; third week, 70; fourth week, 60; fifth week, 50; sixth week, 40. After the sixth week there is no refund. For refund purposes the date of official dropping of courses or withdrawal from school as certified by Student Affairs office will determine the amount of the refund. The student should bring his receipted fee statement and activity card with him when he seeks a refund from the Cashier's Office.

Members of reserve units activated for military service may receive full refund of tuition if credits or incompletes cannot be allowed.

Registration

GENERAL

Registration for classes at the University occurs each academic quarter. New students will be mailed registration instructions prior to the start of the quarter. The mailing will contain the student's "permit to register" and the time and place of registration.

Students currently enrolled at UMD will be advised of registration dates and procedures through the *Statesman* and the printed *Class Schedule*.

Returning students should refer to the Admission Section of this bulletin for reenrollment instructions.

COURSE NUMBERS

Courses numbered 1-000 to 1-998 are Lower Division and are primarily for freshmen and sophomores.

Courses numbered 3-000 to 3-998 are Upper Division and are generally restricted to juniors and seniors.

Courses numbered 5-000 to 5-998 are open to Upper Division and graduate students.

Courses numbered 8-000 and over are open to graduate students only.

CREDIT LOADS

Students are limited to registering for a maximum of 18 credits in initial registration; however, courses may be added beyond 18 credits during the first week of classes with approval of adviser and instructors of courses involved. Students holding jobs requiring over 20 hours of work per week are advised to enroll in no more than 12 credits per quarter.

AUDITING OF COURSES

For audited courses, the same registration procedure is followed and the same fee charged as for courses bearing credit. Audited courses are not applicable to degree requirements. The registration symbol V is recorded.

REPEATING A COURSE

A student may repeat a course in which he has failed under previous grading policies, received an N, or received a grade of D (see section on Grade Points and Grade Point Average).

CHANGE IN REGISTRATION

A carefully planned program seldom requires change after registration is complete. If a student needs to *cancel* or *add* a course or change registration from audit to credit or from credit to audit, the procedure is initiated in the Records Office, Administration Building. Courses may be added or canceled at any time during the quarter with permission of the instructor and completion of the cancel-add procedure.

WITHDRAWAL FROM COLLEGE

If a student decides to withdraw from college during a quarter or plans not to return in the succeeding quarter, he is urged to officially cancel courses for the current quarter and generally clarify his relationship with the University. This will simplify procedures if he decides to reenroll at a later date. Withdrawal from the University is best accomplished through the Counseling Office.

Students with outstanding financial obligations to the University are not eligible to receive grades or official transcripts of course work completed.

Regulations

GENERAL

Student Responsibility

A student is responsible for completing whatever work is required in each class for which he registers, including makeup of any work missed as a result of excused or unexcused absences. In classes in which attendance is required, excessive unexcused absence may result in a penalty depending upon the policy of the individual instructor. The amount of work generally required is expressed in quarter credits. Each credit demands, on the average, 3 hours a week of a student's time.

Students are expected to know the times for their own final examinations based upon the published Duluth Campus final examination schedule for each quarter which is distributed to all instructors and departments and is posted in various places on campus. Only a conflict between examination times or a schedule of three or more examinations in 1 day will entitle the student to seek adjustment of his examination program. Under these circumstances the student should confer with the supervisor of records and secure a form for requesting a change in examination schedule.

Credit by Examination

Credit by examination is available to any UMD student in all UMD courses. The work must be of passing quality in order that credits, not grades, can be recorded. A student may not take an examination for credit in courses in which he is currently enrolled.

There shall be no distinction between examinations for credit and departmental placement or proficiency examinations. Credits by examination shall be listed separately on the transcript and designated as credit by examination. These are not evaluated as regular, residence, or transfer credits.

Examinations for credits shall be without fee if taken during the student's first quarter of residence or the first quarter after an absence of a year or more except when the institution incurs a service charge for the use of nationally standardized examinations. In such cases students will be required to reimburse the University for the service charge. All other students are required to pay the special examination fee for any examination for credit.

Departments shall offer examinations for credit at least once a quarter, with the date, time, and nature of the examination to be set by the department. To take a special examination, the student shall obtain a Special Examination Form in the Records Office, Administration Building, and complete the procedures outlined though that office.

UMD also awards credit through the successful completion of nationally standardized examinations, e.g., College-Level Examination Programs (CLEP). Students should consult the Admissions Office or Records Office, Administration Building, for more information regarding such examinations.

Transfer of Credit

A student is allowed credit for appropriate work completed at another accredited institution, including work taken in other divisions or colleges within the University of Minnesota. Technical and nontransfer courses from junior colleges are not usually accepted in degree programs.

Transfer courses are evaluated on the basis of content equivalency with a similar course at UMD, and the student will receive appropriate credit. If a transfer course does not have an equivalent at UMD, credit is allowed by departmental designation. Application of these credits to a student's major is accomplished through consultation with the department(s) concerned.

Continuing Education and Extension Credit

College-level credit-bearing courses of the Department of Classes and of the Department of Conferences of the University of Minnesota Continuing Education and Extension may, if appropriate, be used to meet degree requirements. Such credits are evaluated as residence credits. Independent Study (correspondence) credits of the University of Minnesota Continuing Education and Extension may be used to meet degree requirements. Such credits are evaluated as nonresident credit and are subject to the restriction that no more than 6 credits may be used to meet Upper Division major requirements.

GRADING

1. There are five permanent grades—A (highest), B, C, D (lowest), and P (ungraded but of at least D-level performance)—which may be assigned when a student successfully completes work for a course.

2. There is one permanent grade—N—which indicates no credit.

3. A temporary grade of I (incomplete) shall be assigned when a student fails to complete all required work in a course, including the final examination. A student receiving an I should arrange with the instructor to complete

the work not later than the end of the next quarter in residence, at which time a permanent grade is entered on the record. If the student does not complete the course or receives an extension of time to complete the course during his next quarter in residence, an N replaces the I as a permanent grade.

4. The permanent registration symbol W designates official cancellation of a course and is posted by the supervisor of records on the basis of an official change in registration. The symbol W shall be assigned in all cases of official cancellation during the first 6 weeks of classes, and thereafter shall be assigned only if the student is doing satisfactory work at the time of official cancellation. A student who cancels officially after the sixth week of classes and is not doing satisfactory work shall receive an N.

5. A symbol X is reported in continuation courses in which a student is permitted to continue but in which a grade cannot be determined until the sequence is completed. The instructor shall submit a grade for each X when the student has completed the entire sequence.

6. Three types of courses with respect to grading are offered at UMD—mandatory letter-graded courses, mandatory P-N-graded courses, and optional-graded courses in which a student may elect either letter grading or P-N grading.

7. All courses are graded on a mandatory letter-grade basis unless specific approval has been given for mandatory P-N grading or optional grading. A list of courses approved for P-N or optional grading is published prior to each registration.

8. In optional-graded courses, students must make their election of P-N grading or letter grading at the time of registration. Appeals from this policy will be considered by the Special Committee on Grading.

9. The following restrictions apply to the various grading options:

- a. A student seeking a Bachelor's degree must earn a minimum of 135 credits in letter-graded courses.
- b. P-N grading may not be elected by a student in courses which for him fulfill major and/or minor requirements.
- c. Not more than 10 credits may be taken under the P-N grading option during any one quarter, with the exception of one quarter during which a student seeking teacher certification is engaged in practice teaching.
- d. P-N grading may be elected by the student in permissible courses which for him fulfill liberal education requirements not to exceed a total of 15 credits, with not more than 5 credits in any one of the four liberal education categories.

SCHOLASTIC STANDING

Grade Points and Grade Point Average

Quality of work in letter-graded courses is indicated by grade points. Grade points are assigned to permanent letter grades as follows:

Each credit of A	4 grade points
Each credit of B	3 grade points
Each credit of C	2 grade points
Each credit of D	1 grade point

Grade point average is the sum of all grade points earned in letter-graded courses divided by the sum of credits earned in those courses rounded to the nearest hundredth. If credit is earned by a student repeating a course in which he has failed (old grading system) or earned the grade of D, the original grade points and credits attempted will be eliminated from calculation of the grade point average, although the record of the original enrollment will remain.

Scholastic Progress

A cumulative Grade Point Average (GPA) of less than 2.00 at any time indicates to the student that he is not making satisfactory progress toward a degree and is unlikely to meet graduation requirements in a reasonable period of time. An annual review is made of each student's progress. Students failing to make satisfactory progress toward a degree will receive a warning or dismissal notification according to the following schedule.

1. Completion of less than 30 credits with a GPA less than 1.80, a warning.
2. Completion of 30-45 credits with a GPA from 1.50 to 1.80, a warning.
3. Completion of 30-45 credits, with a GPA less than 1.50, a dismissal.
4. Completion of 46-96 credits with a GPA from 1.80 to 2.00, a warning.
5. Completion of 46-96 credits with a GPA of less than 1.80, a dismissal.

The University assumes that a student who has completed more than 96 credits accepts complete responsibility for maintaining satisfactory progress toward a degree.

Academic Dismissal

A student who fails to make satisfactory progress toward a degree will be dismissed under the conditions described in the section on Scholastic Progress.

Scholastic Committee

The Scholastic Committee is a standing committee of faculty and students charged with supervision of requirements for admission and graduation and matters pertaining to scholastic standing and progress.

Petitioning the Scholastic Committee—A student who feels that a particular regulation works to his educational disadvantage may petition the Scholastic Committee for an exception. To do so, he should complete the following steps:

1. Secure the appropriate petition forms in the Records Office.
2. Consult his academic adviser regarding the feasibility of the petition. The adviser must sign all petitions and assist the student to determine whether additional signatures are necessary. Only the appropriate signatures should be obtained for each request.
3. When all required signatures have been obtained, the petition is returned to the secretary of the Scholastic Committee.

Decisions will be rendered by the committee in a reasonable period of time. One copy of the petition will remain in the student's permanent file and one copy will be sent to his adviser. *It is the student's responsibility to pick up his copy of the petition from the secretary following Scholastic Committee action.* Students should not assume what the decision of the committee is and should implement their plans only after they have received their copy of the petition which indicates Scholastic Committee action.

STUDENT BEHAVIOR

Committee on Student Behavior

The Committee on Student Behavior is responsible for maintaining appropriate standards of conduct and citizenship among the members of the UMD student body. When University regulations have been violated, committee action is designed to rehabilitate the individual as well as to protect and enhance the social and academic status of the institution. Membership is made up of students, faculty, and other members of the staff as consultants.

Dismissal for Improper Behavior

A student may be dismissed for behavior inappropriate to his responsibilities as a citizen of the college community. This action is instituted by the Student Behavior Committee.

Degree Programs

REQUIRED LOWER DIVISION PROGRAMS

Although the student's liberal education continues through his junior and senior years, his work in the Lower Division is, in most instances, devoted primarily to meeting liberal education requirements. It is the student's responsibility, in consultation with his adviser, to select the specific liberal education courses that best serve his needs. In planning his program in the Lower Division, the student should also plan to take courses that are prerequisite to the Upper Division courses in his major and minor or that are preprofessional courses.

Liberal Education Requirements

To help the student obtain a background in each of the broad areas of knowledge, a program of Liberal Education Requirements has been established by the UMD Campus Assembly and the University of Minnesota Senate. For the most part these requirements involve Lower Division (1-000) courses. Students are urged to complete these courses by the end of the sophomore year. Studies in the Upper Division will be devoted primarily to meeting the other requirements for graduation and, when possible, to achieving a stronger liberal education.

A student following a preprofessional program is not obligated to meet the UMD Liberal Education Requirements. It is recommended that he study the bulletin of the professional school of his choice and fulfill all possible requirements of that school when completing preprofessional work at UMD.

All degree candidates must satisfy the Freshman Composition and Liberal Education Distribution Requirements. With respect to the latter, the student has a wide range of selection. With the help of his adviser, the student selects those courses within categories below, which seem to be of most personal value.

FRESHMAN COMPOSITION—Engl 1-106/1-107 (4 cr each)

Exemption Policy—Students whose combined score on the MSAT and ACT-English tests is 180 or above will be exempted from Engl 1-106 and 1-107. (*This exemption procedure will be abandoned beginning with the summer of 1973.*) Students completing Engl 1-106 will be exempted from Engl 1-107 upon recommendation of their instructors and the coordinator of Engl 1-106.

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Credit by Examination in Freshman Composition—Students who score (a) 5 or 4 on the AP examination, (b) 3 on that examination and C+ on an essay examination to be taken the first week of classes, or (c) in the 75th percentile or above on the CLEP *subject* examination in English Composition without the optional essay will be granted credit in Engl 1-106/1-107.

Students who score (a) in the 48th to the 74th percentile on the CLEP *subject* examination in English Composition, or (b) in the 60th percentile or above on the CLEP *general* examination in English Composition will be granted credit in Engl 1-106.

Note—The cut-off points on the CLEP examinations are subject to adjustment.

Liberal Education Distribution Requirements

48 additional credits distributed among the following four categories of knowledge, with no fewer than 9 credits and no more than 18 credits applied toward each category. Not more than 12 credits from a student's major field may be applied toward any one category of knowledge. Courses must be selected from a minimum of any two departments within each of the categories and a minimum of 3 credits is required from at least two departments used. Freshman Honors Seminar credits are assigned to various categories depending upon their content.

A maximum of 4 credits of health and/or physical education activity courses may be included within the 48-credit distribution requirements, with not more than 2 credits to be included within any one of the four categories. These credits cannot be used to satisfy the requirements that courses in each category must be selected from two departments. (See Physical Education Department course listings for Liberal Education physical education activity courses.)

Liberal Education Courses

CATEGORY 1. COMMUNICATION, LANGUAGE, SYMBOLIC SYSTEMS (9-18 credits)

(English and Foreign Language Communication Skills††;

Linguistics, Rhetoric, Logic, and Philosophic Analysis; Mathematics)

AmIn 1-101/1-102—Beginning Chippewa (5 each)	Math 1-154—Interdisciplinary Mathematics II (4)
Engl 1-811—Introduction to Language (4)	Math 1-185—Pre-Calculus Analysis (5)
Fr 1-101/1-102/1-103—Beginning French (5 each)	Math 1-283—CRICISAM Calculus I (5)
Fr 1-201/1-202/1-203—Intermediate French (3 each)	Math 1-286—Calculus I (4)
Ger 1-101/1-102/1-103—Beginning German (5 each)	Math 3-030—Mathematics for Liberal Education (5)
Ger 1-201/1-202/1-203—Intermediate German (3 each)	Math 3-501—Fortran Programming (3)
Jour 1-102—Introduction to Mass Communications (4)	Math 3-561—Elementary Statistics (4)
Lat 1-101/1-102/1-103—Beginning Latin (5 each)	Phil 1-001—Introduction to Philosophy (4)
Math 1-080—Mathematics I, Elementary Education (4)	Phil 1-003—Ethics and Society (4)
Math 1-081—Mathematics II, Elementary Education (4)	Phil 1-005—Logic and Scientific Method (5)
Math 1-153—Interdisciplinary Mathematics I (4)	Span 1-101/1-102/1-103—Beginning Spanish (5 each)
	Span 1-201/1-202/1-203—Intermediate Spanish (3 each)
	Spch 1-101—Rhetoric of Our Times (3)
	Spch 1-111—Beginning Public Speaking (3)
	Spch 1-202—Interpersonal Communication (3)

†† All foreign languages are considered to be within a single departmental area.

CATEGORY 2. THE PHYSICAL AND BIOLOGICAL SCIENCES (9-18 credits)

- Ast 1-010, 1-020—Descriptive Astronomy (3 each)
 Biol 1-003—Biology for Elementary Education (4) (*elementary education only*)
 Biol 1-009—Upside Down Biology (5)
 Biol 1-102—Biology and Man (5)
 Biol 1-105/1-106†—General Biology and Laboratory (3/2)
 Biol 1-107/1-108†—General Biology and Laboratory (3/2)
 Chem 1-101—Aspects of Chemistry (5)
 Chem 1-103/1-104, 1-110/1-111, 1-120/1-121—General Chemistry (5 each)
 Chem 1-108—Chemistry for Elementary Education (4 or 1) (*elementary education only*)
 Chem 3-106—Chemistry in Modern Life (4)
 Geog 3-412—Weather Elements (4)
 Geol 1-100—Topics in Geology (1)
 Geol 1-110—Introductory Geology (5)
 Phys 1-001/1-002, 1-003—Elementary Physics (4 each)
 Phys 1-020—Physics for Elementary Education (4) (*elementary education only*)
 Phys 1-030/1-031—Introduction to Physics (4 each)
 Phys 1-037—Applied Physics (5)

CATEGORY 3. MAN AND SOCIETY (9-18 credits)

(*The Analysis of Human Behavior and Institutions; The Development of Civilization: Historical and Philosophical Studies*)

- AmIn 3-051—American Indians in the 20th Century (4)
 Anth 1-602—Prehistoric Man and Culture (5)
 Anth 1-604—Cultural Anthropology (5)
 Econ 1-002—Introduction to Economics (4)
 Econ 1-004—Principles of Economics: Micro (4)
 Econ 1-005—Principles of Economics: Macro (4)
 Geog 1-201—Man and His Habitat (4)
 Geog 1-303—Cultural Geography (4)
 Geog 1-305—Environmental Conservation (4)
 Geog 1-312—Economic Geography (4)
 Geog 1-403—Physical Geography (4)
 Hist 1-054, 1-055, 1-056—Ancient Civilization (4 each)
 Hist 1-204, 1-205, 1-206—Civilization of the Modern World (4 each)
 Hist 1-301, 1-302, 1-303—American History (4 each)
 Hist 1-366—Afro-American History (5)
 Hum 1-001, 1-002, 1-003—Introduction to Humanism (3 each)
 Hum 1-031, 1-032, 1-033—American Life (3 each)
 Phil 3-004—Western Intellectual History (5)
 Phil 3-110—American Philosophy (4)
 Phil 3-112—Existentialism and Phenomenology (4)
 Pol 1-010—American Government and Politics (5)
 Pol 1-050—International Relations (4)
 Psy 1-003—General Psychology (5)
 Psy 1-501—Human Development and Adjustment (3)
 Soc 1-100—Problems of American Society (5)

CATEGORY 4. ARTISTIC EXPRESSION (9-18 credits)

(*Literature; The Arts*)

- Art 1-001—Art Today (4)
 Art 1-002—Introduction to Art (4)
 Art 1-010, 1-011, 1-012—Studio Fundamentals (3 each)
 Art 1-405—Ceramics (3)
 Engl 1-504, 1-505—Masterworks of English Literature (4 each)
 Engl 1-523—Medieval Literature I (4)
 Engl 1-533—16th-Century English Literature I (4)
 Engl 1-543—17th-Century English Literature I (4)
 Engl 1-553—18th-Century English Literature I (4)
 Engl 1-561—19th-Century American Literature (4)
 Engl 1-565—Romantic Prose and Poetry I (4)
 Engl 1-566—Victorian Prose and Poetry I (4)
 Engl 1-572, 1-573—20th-Century Literature (4 each)
 Engl 1-905—Introduction to Literature (4)
 Engl 3-204—Development of Dramatic Literature (4)
 Engl 3-504, 3-505—World Literature (4 each)
 Engl 3-511—Continental Literature (4)
 Fr 3-511—Literature in Translation (4)
 Ger 3-511—Literature in Translation (4)
 Hum 1-004, 1-005**—Understanding the Arts (3 each)
 Hum 1-006**—Arts in the 20th Century (3)

** Offered summer only.

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Hum 1-007—Arts in America (3)	Mu 3-221/3-222/3-223—Music Literature (3 each)
Hum 1-021—Classical Mythology (4)	PE 1-024—Modern Dance (1)
Hum 1-022—The Bible as Literature (4)	PE 1-124—Intermediate Modern Dance (1)
Hum 1-023—Folklore (4)	PE 1-325—Elements of Dance Composition (2)
Hum 1-101, 1-102, 1-103—Survey of the Arts (4 each)	PE 1-425—Dance Composition in Basic Forms (2)
Hum 3-101—Jazz Studies (4)	Span 3-511—Literature in Translation (4)
Mu 1-001—Introduction to Music (3)	Spch 1-301—Introduction to Communication Media (3)
Mu 1-221/1-222/1-223—Musical Styles (2 each)	SpTh 1-500—Introduction to Theater Arts (4)
Mu 1-501, 3-501—Concert Band (1 each)	SpTh 1-535—American Theater History (4)
Mu 1-502, 3-502—Varsity Band (1 each)	
Mu 1-511, 3-511—Concert Choir (1 each)	
Mu 1-512, 3-512—Chorale (1 each)	
Mu 1-551, 3-551—Orchestra (1 each)	

PROCEDURES IN UPPER DIVISION

During their junior and senior years, students complete the remaining requirements for graduation, foremost of which is the completion of the major(s) within some particular department(s).

A student becomes an Upper Division major upon completion of 84 credits with a scholastic average of 2.00 (C) and after he has declared his "Intent to Major" with the appropriate department(s). A student declares his intent to major by obtaining the appropriate forms from the Advisement Office in the Administration Building. He will then be referred to his major department(s) for advisement and filing of the forms. Planning and completion of an approved program is the mutual responsibility of the student and the department(s) involved.

Students with a scholastic average of less than 2.00 (C) may be accepted as a major at the discretion of the department. However, any student is permitted to register in any course at UMD provided that published course prerequisites have been fulfilled.

Because class sections and faculty size are determined in part by departments on the basis of the number of major advisees, it is imperative that students file the intent to major by not later than 105 credits or face possible withholding of registration materials.

To change his major a student must file a new "Intent to Major" form through the Advisement Office.

Prior to application for graduation through the Records Office, a student must submit a course record form which he has completed and which has been approved by the head(s) of his major department(s). This form is available from his faculty adviser.

REQUIREMENTS FOR DEGREES

General Requirements—Degrees from the University of Minnesota are granted by the Board of Regents on recommendation of the faculty. Steps leading to the granting of a degree are:

1. A student must meet all the course, credit, and grade average requirements of the department, school, college, and/or division of the University in which he is enrolled.

2. He must meet residence requirements. This means that the UMD graduate must have earned a minimum of 45 credits in residence during his junior and senior years. Extension courses count as residence credit; correspondence courses do not. Students using Continuing Education and Ex-

tension residence and credits must take their last 30 credits with the approval of a UMD major adviser.

3. He must meet all financial obligations to the University.

4. Applications for graduation must be filed with the Records Office at least 6 weeks before graduation. Diplomas are granted at the end of each academic quarter, but Commencement exercises are held in June and August only. Participation in Commencement is voluntary. Students wishing to participate in the exercises must notify the Records Office of their intention to do so, no later than May 1 (for June Commencement), and August 1 (for August Commencement).

BULLETIN USAGE

A student may fulfill degree requirements (as set forth under "Requirements for Degrees," pages 44-45) from any combination of UMD bulletins which have been in effect (1) since he entered college, junior college, or university, and (2) within 8 years of his graduation from UMD.

REQUIREMENTS FOR BACHELOR OF ARTS DEGREE

1. Completion of 56 hours of credit in Liberal Education courses as shown on pages immediately preceding.

2. Completion of an academic major (B.A.) with a minimum 2.00 (C) average. Departmental sections in this bulletin should be consulted for possible additional or substitute requirements. The completion of this major requirement may call for courses in related fields outside of the major subject. To earn a major or minor from UMD, a student must be accepted and have his program approved by the department involved. He must maintain a minimum 2.00 (C) average for all courses taken in each major and minor field. This average applies not only to courses taken at UMD calculated separately but also to the total, including courses taken elsewhere in each field. Majors (B.A.) must include 27 credits in Upper Division courses.

3. Completion of 30 Upper Division credits of work outside the major department in courses numbered 3-000 or above. If the student elects to complete a minor, he may do so. Any Upper Division credits included in the minor may be counted toward the 30 Upper Division credits required outside the major, provided that the credits are not also counted within the major. Students completing the following B.A. majors are required to complete only 15 Upper Division credits outside the major: Art Major-Art History Minor Combination, Music, and Urban Studies.

4. Completion of elective courses to provide a total of 180 or more credits.

5. A minimum 2.00 (C) average in all work attempted in residence and an overall 2.00 (C) average (including transfer credits).

6. B.A. degree candidates may earn teacher certification by fulfilling professional education requirements and equivalents of the B.S. degree major. For clarification see items 2 and 6 under requirements for the B.S. degree.

7. Both B.A. and B.S. degrees in a single major field may be obtained by fulfilling the course requirements for each degree. Under such circumstances a minimum of 45 residence credits are required for each degree. Credits

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earned in required education courses cannot be used in fulfilling the B.A. requirement for 30 Upper Division credits outside the major.

8. Compliance with the general regulations governing granting of degrees. Not later than the end of the junior year, the student should check on his status with respect to meeting graduation requirements.

REQUIREMENTS FOR BACHELOR OF ACCOUNTING DEGREE

1. Completion of 56 hours of credit in Liberal Education courses as shown on the pages immediately preceding (included in item 2).

2. Completion of 92 prebusiness credits as shown in the degree program, with a minimum average of 2.00 (C). Before entering the rest of this degree program, a student must file Upper Division papers and receive departmental approval.

3. Completion of remaining 98 required credits with a minimum average of 2.00 (C). This average applies not only to courses taken at UMD calculated separately but also to the total, including courses taken elsewhere.

4. Accumulation of at least 2 grade points for each credit attempted in residence (an overall average of 2.00 [C] or better).

5. Compliance with the general regulations governing granting of degrees. Not later than the end of the junior year, the student should check on his status with respect to meeting graduation requirements.

REQUIREMENTS FOR BACHELOR OF BUSINESS ADMINISTRATION DEGREE

1. Completion of 56 hours of credit in Liberal Education courses as shown on the pages immediately preceding (included in item 2).

2. Completion of 92 prebusiness credits as shown in the degree program, with a minimum average of 2.00 (C). Before entering the rest of this degree program, a student must file Upper Division papers and receive departmental approval.

3. Completion of remaining 90 required credits with a minimum average of 2.00 (C). This average applies not only to courses taken at UMD calculated separately but also to the total, including courses taken elsewhere.

4. Accumulation of at least 2 grade points for each credit attempted in residence (an overall average of 2.00 [C] or better).

5. Compliance with the general regulations governing granting of degrees. Not later than the end of the junior year, the student should check on his status with respect to meeting graduation requirements.

REQUIREMENTS FOR BACHELOR OF SCIENCE DEGREE

1. Completion of 56 hours of credit in Liberal Education courses as shown on the pages immediately preceding.

2. Completion of an academic major (B.S.) with a minimum 2.00 (C) average. Departmental sections in this bulletin should be consulted for possible additional or substitute requirements. The completion of this major requirement may call for courses in related fields outside of the major. To

earn a major or minor from UMD a student must be accepted and have his program approved by the department involved. He must maintain a minimum 2.00 (C) average for all courses taken in each major and minor field. This average applies not only to courses taken at UMD calculated separately but also to the total, including courses taken elsewhere in each field.

3. Completion of 30 Upper Division credits of work outside the major in courses numbered 3-000 or above. If the student elects to complete a minor, he may do so. Any Upper Division credits included in the minor may be counted toward the 30 Upper Division credits required outside the major, provided that the credits are not also counted within the major. Students completing the following B.S. majors are required to complete only 15 Upper Division credits outside the major: Social Science and Comprehensive Major in Industrial Education.

4. Completion of elective courses to provide a total of 192 or more credits.

5. A minimum 2.00 (C) average in all work attempted in residence and an overall 2.00 (C) average (including transfer credits).

6. Both B.A. and B.S. degrees in a single major field may be obtained by fulfilling the course requirements for each degree. Under such circumstances a minimum of 45 residence credits are required for each degree. Credits earned in required education courses cannot be used in fulfilling the B.A. requirement for 30 Upper Division credits outside the major.

7. Compliance with the general regulations governing granting of degrees. Not later than the close of the junior year, the student should check on his status with respect to meeting graduation requirements.

REQUIREMENTS FOR ASSOCIATE IN ARTS DEGREE

1. Completion of 56 hours of credit in Liberal Education courses as shown on the pages immediately preceding.

2. Completion of elective courses to provide a total of 90 or more credits.

3. A minimum 2.00 (C) average in all work attempted in residence and an overall 2.00 (C) average (including transfer credits).

4. Compliance with the general regulations governing granting of degrees. (Refer to beginning of this section.) Two quarters of student's terminal year for the A.A. degree must be in residence.

REQUIREMENTS FOR TEACHER CERTIFICATION

Candidates for a teaching certificate must fulfill all requirements for a 4-year degree. In addition they must complete an "approved program," i.e. a program which has the approval of the State Department of Education. For secondary teaching, approved programs consist of majors and minors specified by various academic departments for teacher education, and the professional-educational sequence listed under secondary education. The approved program for candidates for elementary teaching is the major in elementary education listed under that department.

Upon completing the program, a student may obtain application for certification forms in the Placement Office. The completed forms (with proper fee) are then forwarded by the University to the State Department of Education, the state certification agency.

Secondary candidates should be aware that while the completion of one or more minors may enhance their initial potential for employment, State Department of Education regulations make them of only temporary value. In most cases if one teaches in the area of a minor, he will be required to build the minor into a major within a 7-year period after initial certification.

Physical Examinations—The Minnesota State Department of Education requires that any applicant for a teaching certificate must be “physically competent” to teach in his field. The examination should be taken during the last 2 quarters of residency, but not later than 4 weeks prior to application for a teaching certificate. Students should make arrangements for these examinations at the University Health Service.

Although the teacher-preparation program at UMD serves to fulfill certification requirements for many states other than Minnesota, there is an increasing number of states which are demanding that highly specialized requirements be met. Hence, if a student knows in advance that he will be seeking employment in another state, he should make early inquiry into this matter in the Placement Office. (See also Education, page 81.)

SECTION 2

Major-Minor Requirements and Courses

AEROSPACE STUDIES (Air)

Advisers—Lieutenant Colonel Reese; Majors Desmond, Lance; Captain Hebrank

The curriculum consists of required aerospace studies. The General Military Course (freshmen and sophomores) requires 2 hours per week; the Professional Officer Course (juniors and seniors) requires 4 hours. These hours include 1 hour per week of corps training.

Enrollment in the General Military Course of Air Force ROTC does not confer military status upon cadets. Cadets are civilians and have the same military service obligation required of any citizen. The professor of aerospace studies may defer all students enrolled in AFROTC who are seriously pursuing a degree and a commission. Deferred cadets receive a 1-D (Military Reserve) classification. Failure of cadets to remain in good academic standing may result in loss of membership and removal of the deferment.

Upon approval of the professor of aerospace studies, a student may obtain waiver of the General Military Course, or portions thereof, on the basis of prior honorable active United States military service. In addition, Air Force ROTC credits are transferable between colleges or universities having a department of aerospace studies. All cadets who have successfully completed 6 quarters of Air Force ROTC, or its equivalent in creditable prior military service, and who have met the selection criteria are eligible for formal enrollment in the Professional Officer Course on pay status. Each 4-year program cadet who is accepted into the Professional Officer Course must sign an agreement to complete his course of study; to attend a field training unit at an Air Force base for 4 weeks between his sophomore and junior years in college, or, if a 2-year program cadet, to attend a 6-week field training unit; to accept a commission obligating him to serve on active duty for not less than 4 years for nonflying personnel and not less than 6 years for flying personnel (pilots and navigators); and to remain a member of a regular or reserve component of the Air Force until the sixth anniversary of the receipt of his commission.

Uniforms, textbooks, and related materials for regular aerospace studies are furnished the student without charge.

The professor of aerospace studies may permit a student who does not meet prescribed enrollment criteria to pursue the General Military Course or the Professional Officer Course for academic credit only. The Air Force ROTC program includes such special activities as intramural athletics, Arnold Air Society, and Angel Flight auxiliary.

Freshmen are permitted to enroll in the General Military Course, a 4-year program, as late as the second quarter of their freshman year. Sophomore students may become applicants for the 2-year program during their sophomore year.

To gain maximum benefits and establish qualification in competing for AFROTC scholarships, freshmen are encouraged to initiate enrollment immedi-

Section 2—Major-Minor Requirements and Courses

ately upon entering the University. (See Financial Aids, section on Scholarships.)

FOUR-YEAR COMMISSIONING PROGRAM

REQUIRED COURSES

Air 1-101, 1-102, 1-103, 1-201, 1-202, 1-203, 3-301, 3-302, 3-303, 3-401, 3-402, 3-403 (24)

MINOR IN AEROSPACE STUDIES FOR THE B.A. DEGREE

REQUIRED COURSES

All courses required for the 4-year commissioning program plus Pol 3-412—International Law III (27)

ELECTIVE COURSES

Air 3-481 (required of cadets participating in the Flight Instruction Program)

COURSES

General Military Course

- 1-101. UNITED STATES MILITARY FORCES.** (1 cr; 1 hr lect, 1 hr lab)
Mission, doctrine, and organization of the United States Air Force. The specific functions of U.S. strategic offensive forces and their employment.
- 1-102. UNITED STATES MILITARY FORCES.** (1 cr; 1 hr lect, 1 hr lab)
The specific functions of U.S. strategic defensive forces and their deployment. The U.S. General Purpose Forces; Army, Navy, Marines.
- 1-103. UNITED STATES MILITARY FORCES.** (1 cr; 1 hr lect, 1 hr lab)
The U.S. General Purpose Forces; U.S. Air Force tactical forces. Aerospace support forces and their functions.
- 1-201. DEFENSE POLICY FORMATION.** (1 cr; 1 hr lect, 1 hr lab)
Defense organization; national power and the Department of Defense. Defense policies; theories and principles of general war, and nature and context of limited war.
- 1-202. DEFENSE POLICY FORMATION.** (1 cr; 1 hr lect, 1 hr lab)
Policies and strategies of the Soviet Union and China; the role of alliances in U.S. defense policies.
- 1-203. DEFENSE POLICY FORMATION.** (1 cr; 1 hr lect, 1 hr lab)
Defense organization and decision making; organization and functions of the Department of Defense; role of the military in the U.S. national policies; the elements and process of defense policy making.

Professional Officer Course

- 3-301. DEVELOPMENT OF AEROSPACE POWER.** (3 cr; 3 hrs seminar, 1 hr lab)
The communicative process; history of air power and its development in the United States. Seminar concept; extensive research with oral and written reports.
- 3-302. DEVELOPMENT OF AEROSPACE POWER.** (3 cr; 3 hrs seminar, 1 hr lab)
The communicative process; aerospace power today; defense strategy; the Air Force in a changing defense environment; employment of Air Forces; the future of manned aircraft. Seminar concept; extensive research with oral and written reports.
- 3-303. ASTRONAUTICS AND SPACE OPERATIONS.** (3 cr; 3 hrs seminar, 1 hr lab)
The communicative process; astronautics and space operations; the national space effort; spatial environment; orbits and trajectories; space vehicle systems; future developments in space. Seminar concept; extensive research with oral and written reports.
- 3-401. LEADERSHIP AND MANAGEMENT.** (3 cr; 3 hrs seminar, 1 hr lab)
Leadership theory; communications and leadership; challenges to the Air Force officer; behavioral science and Air Force leadership; multidimensional approach to

- leadership; Military Justice System; seminar concept; extensive research with oral and written reports.
- 3-402. LEADERSHIP AND MANAGEMENT.** (3 cr; 3 hrs seminar, 1 hr lab)
Styles of leadership; introduction to Air Force management; the planning function of management; seminar concept; extensive research with oral and written reports.
- 3-403. LEADERSHIP AND MANAGEMENT.** (3 cr; 3 hrs seminar, 1 hr lab)
Air Force management; Air Force personnel policies; preparation for active duty; seminar concept; extensive research with oral and written reports.
- 3-481. WEATHER AND NAVIGATION.** (3 cr)
Weather; Federal Aviation Agency regulations; dead reckoning navigation; radio navigation; related topics required for the completion of private pilot's written examination. Required for AFROTC cadets accepted for the Flight Instruction Program. Open to any student interested in preparing to take the FAA written examination for the private pilot's license.

AMERICAN INDIAN STUDIES (Amln)

Director—Instructor Powless

The American Indian Studies program is designed to promote Indian awareness through a better understanding of American Indian cultures, histories, and present-day situations. The program, developed by members of the local Indian community, serves both to acquaint the non-Indian with the situations and problems of the American Indian peoples, and to broaden and develop the knowledge of the Indian student in his heritage in order to promote a positive concept of self-identity and pride in ancestry. The program will, in addition, provide training and supportive resources for those in the areas of teaching social services.

COURSES

- 1-101/1-102. BEGINNING CHIPPEWA.** (5 cr each)
Speaking and comprehension of basic Chippewa speech patterns. Development of rudimentary reading knowledge.
- 3-051. AMERICAN INDIANS IN THE 20TH CENTURY.** (4 cr; prereq one introductory course in the social sciences or #)
Topical review of Indian-White contacts, circa 1887 to present, including Indian societies' adaptation to contemporary social conditions.

ANTHROPOLOGY (Anth)

(Sociology-Anthropology Department)

All anthropology courses may apply toward a major or minor in sociology.

COURSES

- 1-602. PREHISTORIC MAN AND CULTURE.** (5 cr, §1-601)
Origin and development of extinct and living varieties of man and principles of biocultural evolution; growth and differentiation of cultures from their beginnings to the Bronze and Iron Ages.
- 1-604. CULTURAL ANTHROPOLOGY.** (5 cr, §1-603)
Analysis of the range of variation and degree of uniformity in human behavior as revealed through comparative ethnographic study of the major institutions of pre-literate societies in all parts of the world.
- 3-612. PEOPLES AND CULTURES OF MIDDLE AMERICA.** (4 cr, §3-611; prereq 1-604 or #)

Section 2—Major-Minor Requirements and Courses

Ethno-archaeological survey of both native and Indian-Spanish-speaking people of Middle America. Analysis of cultural processes that have produced the cultures of Mexico and Central America.

- 3-614. INDIANS OF NORTH AMERICA.** (4 cr, §3-613; prereq 1-604 or #)
Ethno-archaeological survey of the native peoples of the major cultural areas of North America.
- 3-620. INDEPENDENT STUDY IN ANTHROPOLOGY.** (1-5 cr [may be repeated for a maximum of 10 cr], §3-619; prereq sociology major or minor, jr, sr, or #)
Directed reading and research leading to the presentation of a paper.
- 5-615. CULTURE AND PERSONALITY.** (3 cr; prereq 1-604 and Soc 3-170 or Soc 3-700, sr, or #; offered when feasible)
The role of culture in forming of personality; problems of individual adjustments to demands of culture. Psychological and sociopsychological approach to culture.
- 5-617. SOCIAL ANTHROPOLOGY.** (3 cr, §3-617; prereq 1-604 or #)
An analysis of institutional patterns of kinship and marriage, economic, political, legal, and magico-religious organization with reference to functional and evolutionary processes, and to anthropological method and theory.
- 5-622. APPLIED ANTHROPOLOGY.** (3 cr; prereq 1-604, sr or #)
Application of anthropology to current problems of government, industry, education, and social welfare planning. Role of anthropology in such administrative activities as technical aid, public health.
- 5-624. SPECIAL TOPICS IN ANTHROPOLOGY.** (3 cr [may be repeated for cr]; prereq 1-604 or #; whenever offered, topic will be announced in *Class Schedule*)
A proseminar on contemporary topics in all branches of anthropology.

ART

Advisers—Professor Boyce; Instructor Brutger; Lecturer Stone

See Section 4 for master of arts degree program in art.

The Department of Art seeks to contribute to the general education of all students through courses and activities designed to develop personal aesthetic values and an understanding of the interrelation of the fine and applied arts in our culture of the past and present.

For the student whose main interests and aptitudes lie within the field of art, a series of preprofessional courses intended to develop maximum aesthetic awareness of art as well as basic technical skills and knowledge of art processes is available in several plans. For the student wishing to teach art, a program of courses provides for the development of the teacher as a creative artist and provides the student with a basic understanding of the role of art in education. Students should plan schedules so that they can fulfill student teaching requirements in 1 quarter of the senior year in a community outside of Duluth. Except in cases where commuting is possible this assignment will necessitate living in that community for the entire quarter.

Tweed Museum of Art, an integral part of the Department of Art, is open to students and to the general public all year. Periodically a new exhibition of regional or national importance is installed. Thus the art student may study loan exhibitions as well as the extensive permanent Tweed collection of paintings.

Any student may be required to leave permanently with the department outstanding examples of his work. These examples, selected by a faculty committee, will be used for exhibition purposes and as a continuing record. All art majors will be required to present in Tweed Museum of Art during the senior year an exhibition of their student work.

MAJOR IN ART FOR THE B.A. DEGREE

Freshman Year

Art 1-010, 1-011, 1-012—Studio Fundamentals (9)
Hum 1-101, 1-102, 1-103—Survey of the Arts (any two of the three) (8)

Sophomore Year

Studio electives** (9)
Art 3-710, 3-711, 3-712—Drawing (6)

Junior Year

Studio electives** (12)
Art history electives (5)

Senior Year

Studio electives** (9)
Art 5-910—Art Seminar (4)
Art history electives (4)
Total (66)

ART MAJOR-ART HISTORY MINOR COMBINATION FOR THE B.A. DEGREE

Freshman Year

Art 1-010, 1-011, 1-012—Studio Fundamentals (9)
Hum 1-101, 1-102, 1-103—Survey of the Arts (any two of the three) (8)

Sophomore Year

Art 3-710, 3-711, 3-712—Drawing (6)
Studio electives§§ (9)
Art history electives (5)

Junior Year

Studio electives§§ (18)
Art history electives (4)

Senior Year

Studio electives§§ (18)
Art history electives (9)
Art 5-910—Art Seminar (4)
Total (90)

MINOR IN ART FOR THE B.A. DEGREE

Art 1-010, 1-011, 1-012—Studio Fundamentals (9)
Hum 1-101, 1-102, 1-103—Survey of the Arts (any two of the three) (8)

Studio electives (not to exceed 6 cr in any one area) (18)

Total (35)

MINOR IN ART HISTORY FOR THE B.A. DEGREE

Hum 1-101, 1-102, 1-103—Survey of the Arts (any two of the three) (8)
Art 1-001—Art Today (4)

Art history electives (18)

Total (30)

MAJOR IN ART FOR THE B.S. DEGREE

Required for students intending to seek teacher certification. Students are urged to consider the B.A. minor in art history, home economics, humanities, industrial arts, or psychology.

** Studio electives are to be taken from the following six areas: painting, sculpture, print processes, ceramics, crafts, and photography. Students must take at least one 3-credit course in each area with a minimum of 6 credits in at least three of the areas and a maximum of 12 credits in any one area.

§§ Studio electives are to be taken from the following six areas: painting, sculpture, print processes, ceramics, crafts, and photography. Students must take a minimum of 6 credits in each area (except photography for 3 credits) with a maximum of 12 in any one area from the required elective group. Gallery practice for 4 credits may be substituted for an art history course.

Section 2—Major-Minor Requirements and Courses

Freshman Year

Art 1-010, 1-011, 1-012—Studio Fundamentals (9)
Hum 1-101, 1-102, 1-103—Survey of the Arts (any two of the three) (8)

Sophomore Year

Art 3-710, 3-711—Drawing (4)
Studio electives** (9)
Art history electives (5)

Junior Year

Art 3-810—Art in Elementary Education (5)
Art 3-815—Art in Secondary Education (5)
Studio electives** (12)

Senior Year

Art 5-910—Art Seminar (4)
Studio electives** (9)
Art history electives (4)

Total (74)

MINOR IN ART FOR THE B.S. DEGREE (Secondary)

Recommended for students intending to seek secondary teacher certification.

Art 1-010, 1-011, 1-012—Studio Fundamentals (9)
Art 3-815—Art in Secondary Education (5)
Studio electives from painting, sculpture, print processes, or drawing (8)
Studio electives from ceramics, crafts, or photography (6)

Hum 1-101, 1-102, 1-103—Survey of the Arts (any two of the three) (8)
Student teaching required

Total (36)

MINOR IN ART FOR THE B.S. DEGREE (Elementary)

Recommended for students intending to seek elementary teacher certification.

Art 1-010, 1-011, 1-012—Studio Fundamentals (9)
Art 3-810—Art in Elementary Education (5)

Hum 1-101, 1-102, 1-103—Survey of the Arts (any two of the three) (8)
Studio electives (3 areas) (9)

Total (31)

COURSES

Art (Art)

1-001. ART TODAY. (4 cr, §1-004)

Introductory survey of the influence of art in daily life as seen in city planning, the home, other architecture, painting, sculpture, religion, commerce, and industry.

1-002. INTRODUCTION TO ART. (4 cr, §1-005; prereq for all studio art courses)

A studio course in art for those with little or no creative experience in art, introducing various materials, techniques, and problems. Emphasis will be placed on studio work, class discussions, films, and outside reading.

1-010. STUDIO FUNDAMENTALS. (3 cr; prereq 1-002 or Δ)

Introduction to the drawing experience and other problems concerned with the translation of three-dimensional visual experience into two-dimensional form.

1-011. STUDIO FUNDAMENTALS. (3 cr; prereq 1-002 or Δ)

Introduction to design in art and nature through a study of primary elements and structural aspects and exploration of the application of these elements in various media.

1-012. STUDIO FUNDAMENTALS. (3 cr; prereq 1-002 or Δ)

An introduction to basic concepts and materials of three-dimensional form and space.

** Studio electives are to be taken from the following six areas: painting, sculpture, print processes, ceramics, crafts, and photography. Students must take at least one 3-credit course in each area with a maximum of 6 required elective credits in any one area from the required elective group. Elective studio art courses should be substituted for art history and humanities courses required for students selecting the minor in art history.

- 1-016. LETTERING.** (3 cr; prereq 1-002)
Development of freehand discipline in lettering and manuscript.
- 1-100. PAINTING.** (3 cr; prereq 1-010, 1-011, 1-012)
Basic concepts in form, color, space, with water-based media.
- 1-125. WATERCOLOR PAINTING.** (3 cr; prereq 1-010, 1-011, 1-012)
Watercolor, gouache, and other water-base media.
- 1-200. SCULPTURE.** (3 cr; prereq 1-010, 1-011, 1-012)
Basic concepts in volume and space using modeling, casting, and carving processes.
- 1-300. PRINT PROCESSES.** (3 cr; prereq 1-010, 1-011, 1-012)
Basic concepts in traditional and contemporary fine art print techniques.
- 1-400. CERAMICS.** (3 cr; prereq 1-010, 1-011, 1-012)
Hand forming methods, decoration, glazing, elementary glaze chemistry, and firing of pottery.
- 1-405. CERAMICS.** (3 cr; not for art majors or minors; prereq 1-002 or #)
Elementary forming, decorating, glazing, and firing techniques.
- 1-500. CRAFTS.** (3 cr; prereq 1-010, 1-011, 1-012)
Jewelry and basic crafts.
- 1-600. PHOTOGRAPHY.** (3 cr; prereq 1-010, 1-011, 1-012 or #)
Basic concepts and history of photography leading toward fine art expression through laboratory experience.
- 3-101. PAINTING.** (3 cr; prereq 1-100)
Experiences with pictorial structures with an emphasis on creative expression using oils, acrylics, and mixed media.
- 3-102. DRAWING OR PAINTING.** (3 cr; prereq 3-101)
Individual supervised study; creative projects in drawing and painting.
- 3-201. SCULPTURE.** (3 cr; prereq 1-200)
Experiences with a variety of sculptural form and media with an emphasis on creative expression.
- 3-202. SCULPTURE.** (3 cr; prereq 3-201)
Individual supervised study; creative projects in a sculptural medium of student's special interest.
- 3-301. PRINT PROCESSES.** (3 cr; prereq 1-300)
Experiences with a variety of silkscreen, relief, intaglio, and lithographic fine arts print techniques.
- 3-302. PRINT PROCESSES.** (3 cr; prereq 3-301)
Individual supervised study; creative development of the print processes.
- 3-401. CERAMICS.** (3 cr; prereq 1-400)
Emphasis on wheel forming, glazing, and firing.
- 3-402. CERAMICS.** (3 cr; prereq 3-401)
Individual supervised study; creative projects in ceramics and chemistry of glazes.
- 3-501. CRAFTS.** (3 cr; prereq 1-500)
Metal casting, mosaics, advanced jewelry.
- 3-502. CRAFTS.** (3 cr; prereq 3-501)
Individual supervised study; specialization in a particular craft medium or material.
- 3-601. CREATIVE PHOTOGRAPHY.** (3 cr; prereq 1-600, Upper Division art major or #)
A fine arts approach to various photographic media.
- 3-710, 3-711, 3-712. DRAWING.** (2 cr each; prereq 1-010, 1-011, 1-012)
Intermediate drawing from still life, figure, and landscape.
- 3-800. COMMUNITY INVOLVEMENT THROUGH ART.** (Cr ar [may be repeated for a maximum of 6 cr]; 1 cr for each 25 hrs of field work)
For the student interested in gaining actual experience working with public and private social agencies through an art program.
- 3-810. ART IN ELEMENTARY EDUCATION.** (5 cr, §3-820, §3-821; prereq 1-002)
Instructional problems; growth and development of art expression in children. Studio application of elementary art curriculum.
- 3-815. ART IN SECONDARY EDUCATION.** (5 cr, §3-830; prereq art major or minor)
Objectives and nature of art programs in the secondary school; content and methods. Studio application of secondary art curriculum.

Section 2—Major-Minor Requirements and Courses

- 3-835. PROBLEMS IN ART EDUCATION.** (Cr ar, §3-840; prereq art major or minor and #)
Individual supervised study for especially capable art education students. Practical research in art education techniques.
- 3-950. GALLERY PRACTICE.** (2 cr with Δ [may be repeated for a maximum of 6 cr], §3-900)
Organization of art exhibits, installation methods and techniques, cataloging, research, and documentation of art objects.
- 5-150. PAINTING.** (3 cr per qtr [may be repeated for a maximum of 6 cr]; prereq 3-101 or #) Munoz
Painting in the area of specialized interest.
- 5-151. ADVANCED PAINTING.** (3 cr per qtr [may be repeated for a maximum of 6 cr]; prereq 5-150 or #) Munoz
Individually supervised projects using both traditional and contemporary painting media and techniques.
- 5-173. WORKSHOP IN ADVANCED PAINTING.** (6 cr [may be repeated for a maximum of 12 cr]; prereq §; offered summer only)
Creative work in oil or watercolor with criticism by a nationally recognized American artist.
- 5-250. SCULPTURE.** (3 cr per qtr [may be repeated for a maximum of 6 cr]; prereq 3-201 or #) Christensen, G Nelson
Sculpture in the area of specialized interest.
- 5-251. ADVANCED SCULPTURE.** (3 cr per qtr [may be repeated for a maximum of 6 cr]; prereq 5-250 or #) Christensen, G Nelson
Advanced sculpture in the area of specialized interest.
- 5-273. WORKSHOP IN ADVANCED SCULPTURE.** (6 cr [may be repeated for a maximum of 12 cr]; prereq 3-201 or #; offered every third summer) Christensen or Guest Artist
Development of previously acquired skills in wood, stone, metal, or clay; emphasis on creative discipline.
- 5-350. PRINT PROCESSES.** (3 cr per qtr [may be repeated for a maximum of 6 cr]; prereq 3-301 or #) Meany
Printmaking in the area of specialized interest.
- 5-351. ADVANCED PRINT PROCESSES.** (3 cr per qtr [may be repeated for a maximum of 6 cr]; prereq 5-350 or #) Meany
Advanced printmaking in the area of specialized interest.
- 5-373. WORKSHOP IN ADVANCED PRINT PROCESSES.** (6 cr [may be repeated for a maximum of 12 cr]; prereq 5-350 or #; offered every third summer) Meany or Guest Artist
A concentrated experience in one or more of the disciplines of printmaking, i.e., woodcut (relief), etching (intaglio), lithography, and silkscreen (stencil).
- 5-450. CERAMICS.** (3 cr per qtr [may be repeated for a maximum of 6 cr]; prereq 3-401 or #) G Nelson
Research in studio projects; glaze and body chemistry; ceramic sculpture.
- 5-451. ADVANCED CERAMICS.** (3 cr per qtr [may be repeated for a maximum of 6 cr]; prereq 5-450 or #) G Nelson
Kiln operation and design; studio management; practical problems involving the professional potter and teacher.
- 5-473. WORKSHOP IN ADVANCED CERAMICS.** (6 cr [may be repeated for a maximum of 12 cr]; prereq 3-401 or #; offered every third summer) G Nelson or Guest Artist
Individual supervised study; creative projects in ceramics and ceramic sculpture and study of glazes and body chemistry.
- 5-550. DESIGN.** (3 cr per qtr [may be repeated for a maximum of 6 cr]; prereq 3-501 and #) Schauer
Opportunity to apply design to creative aesthetic problems on an advanced experimental level.
- 5-551. ADVANCED DESIGN.** (3 cr per qtr [may be repeated for a maximum of 6 cr]; prereq 5-550 or #) Schauer
Individual supervised study; research and application of contemporary design theory in precious and nonprecious metals, gem cutting, leather, wood, fiber, and any other design materials.

- 5-573. WORKSHOP IN ADVANCED CRAFTS.** (6 cr [may be repeated for a maximum of 12 cr]; prereq #; offered every third summer) Schauer or Guest Artist
Creative work in any of the major crafts of jewelry, casting, gem cutting, weaving, textiles, leather, mosaics, and other crafts of interest.
- 5-650. ADVANCED PHOTOGRAPHY.** (3 cr per qtr [may be repeated for a maximum of 6 cr]; prereq 3-601 or #) Brutger
Advanced photography in the area of specialized interest.
- 5-651. INDEPENDENT STUDY IN PHOTOGRAPHY.** (1-3 cr [may be repeated for a maximum of 9 cr]; prereq 3-601 or #) Brutger
Individualized study involving photographic media.
- 5-673. WORKSHOP IN EXPERIMENTAL PHOTOGRAPHY.** (6 cr [may be repeated for a maximum of 12 cr]; prereq #; offered every third summer) Brutger
An in-depth approach to the use of photographic equipment and media as a means of fine art expression.
- 5-910. ART SEMINAR.** (4 cr, §5-950; for sr and grad art majors; prereq sr art standing or Δ)
Discussions, readings, and reports in the area of the arts and aesthetic interest.
- 5-990. INDEPENDENT FOREIGN STUDY.** (6-15 cr with Δ; sr or grad standing in art advisable) G Nelson
Travel and research in foreign museums, schools, handcraft industries, and art centers. Advanced planning and supervision of planning necessary. Credit allowed will depend upon nature and scope of the project.
- 8-160. ADVANCED PAINTING.** (3 cr per qtr [may be repeated for a maximum of 9 cr]; prereq 6 cr of 5-151 or #) Munoz
Individually supervised independent project.
- 8-260. ADVANCED SCULPTURE.** (3 cr per qtr [may be repeated for a maximum of 9 cr]; prereq 6 cr of 5-251) Christensen
Development of personal expression in sculpture.
- 8-460. ADVANCED CERAMICS.** (3 cr per qtr [may be repeated for a maximum of 9 cr]; prereq 6 cr of 5-450) G Nelson
Development of an individual style in decoration and form.
- 8-461. CERAMIC GLAZE FORMULATION.** (3 cr per qtr [may be repeated for a maximum of 9 cr]; prereq 6 cr of 5-451) G Nelson
Research in glazes and related decorating techniques.
- 8-462. CLAY AND CERAMIC BODIES.** (3 cr; prereq 6 cr of 5-451) G Nelson
Characteristics of clay and compounded bodies.
- 8-463. KILNS, CONSTRUCTION AND OPERATION.** (3 cr [may be repeated for a maximum of 6 cr]; prereq 6 cr of 5-451) G Nelson
Theory of kiln design, construction, and firing.
- 8-560. MULTI-MEDIA RESEARCH IN CRAFTS.** (3 cr per qtr [may be repeated for a maximum of 6 cr]; prereq 5-550 or #) Schauer
Individualized study in crafts and design leading to intermixing of media and concepts in creative art expression.
- 8-660. RESEARCH IN PHOTOGRAPHY.** (3 cr per qtr [may be repeated for a maximum of 6 cr]; prereq 5-630 or #) Brutger
Individualized study of a particular photographic technique or media leading to a fine art expression.

Art Education (ArEd)

- 5-850. CURRICULUM BUILDING.** (3 cr; prereq sr and #) Boyce, A Smith
Functions of art in education; selection, evaluation, and organization of subject matter to create original teaching units and projects.
- 5-860. IMPLEMENTING INSTRUCTIONAL PROGRAM.** (3 cr; prereq sr and #) Boyce, A Smith
Relation of the instructional program to administrative and supervisory policies; study of facilities and policies for improving the instructional program in art.
- 5-870. ADVANCED COURSE IN TEACHING ART.** (3 cr; prereq sr and #) Boyce, A Smith
Evaluation of current practices; utilization of research findings; introduction of new materials; development of cooperation between classroom teachers and art education specialists.

Section 2—Major-Minor Requirements and Courses

- 5-880. DEVELOPMENT OF ART EDUCATION.** (3 cr; prereq sr and #) Boyce, A Smith
Effect of various 20th-century art movements on the teaching of art in the public schools.
- 8-890.^o PROBLEMS IN ART EDUCATION.** (Cr ar; prereq consent of major adviser) A Smith
Independent projects under staff guidance; may include advanced studio practice or technical problems requiring experimental or library research.

Art History (ArtH)

- 5-166. CLASSICAL ART.** (4 cr, §5-165)
History and development of Greek, Etruscan, and Roman painting, sculpture, and architecture.
- 5-206. MEDIEVAL ART.** (4 cr, §5-205)
Christian art and architecture from late antiquity to the Renaissance.
- 5-305. RENAISSANCE ART.** (5 cr, §5-315, §5-325)
Painting, sculpture, and architecture during the 15th and 16th centuries.
- 5-406. BAROQUE ART.** (4 cr, §5-405)
The art of Europe during the 17th century.
- 5-506. 18th- AND 19th-CENTURY ART.** (4 cr, §5-505)
European art from the rococo period to postimpressionism.
- 5-615. MODERN PAINTING TO WORLD WAR II.** (5 cr, §5-616, §5-617)
Painting and other two-dimensional arts from postimpressionism to abstract expressionism.
- 5-618. TRENDS IN CONTEMPORARY ART.** (4 cr; prereq #)
Painting and sculpture from abstract expressionism to the present day.
- 5-706. ORIENTAL ART.** (4 cr, §5-705)
Survey of the art of India, China, and Japan with an introduction to the religions and philosophies influencing the art.
- 5-950. ANCIENT AND CLASSICAL CERAMICS.** (2 cr [must be taken concurrent with ceramic studio]; 1 hr lect plus studio project)
Survey of the aesthetic and technical development of ceramics.
- 5-951. ORIENTAL CERAMICS.** (2 cr [must be taken concurrent with ceramic studio]; 1 hr lect plus studio project)
Survey of the aesthetic and technical development of ceramics.
- 5-952. ISLAMIC AND RENAISSANCE CERAMICS.** (2 cr [must be taken concurrent with ceramic studio]; 1 hr lect plus studio project)
Survey of the aesthetic and technical development of ceramics.
- 5-953. PRE-COLUMBIAN CERAMICS.** (2 cr [must be taken concurrent with ceramic studio]; 1 hr lect plus studio project)
Survey of the aesthetic and technical development of ceramics.

ASTRONOMY (Ast)

(Science and Mathematics Division)

COURSES

- 1-010. DESCRIPTIVE ASTRONOMY.** (3 cr)
Sun, moon, planets and their motions, satellites, meteors, and comets.
- 1-020. DESCRIPTIVE ASTRONOMY.** (3 cr)
A presentation of the present knowledge of the stars, interstellar space, galaxies, the universe, and relativity.
- 3-050. SPHERICAL AND PRACTICAL ASTRONOMY.** (3 cr)
Determination of time, latitude, and star positions, with applications to navigation and surveying. Work with the 9-inch refractor of the Darling Observatory and the Alworth Planetarium.

3-060. LUNAR ASTRONOMY. (3 cr)

Present-day knowledge of the moon. Historical background underlying modern theories of the moon. Appraisal of the Lunar Orbiter, Surveyor, and Apollo programs. Visual and photographic observations of the moon with portable instruments and the 9-inch refractor of the Darling Observatory. Study of the earth-moon-sun relationship using the facilities of the Alworth Planetarium.

BIOLOGY (Biol)

Advisers—Professors J. Carlson, Hofslund, Krogstad, Monson, Odlaug; Associate Professors Ahlgren, H. Collins, Hedman; Assistant Professors Firling, Fluegel; Instructors Hanten, MacLeod

See Section 4 for master of science program in biology, botany, and zoology.

Honors Program—Qualified majors will be selected at the end of the sophomore year. At the time of application, the student must have an overall average of 2.80 with 3.00 in his major field. Graduation with honors requires an overall grade point average of 3.00 with 3.25 in the major field. The departmental Honors Committee will work with the student's adviser to arrange an Upper Division program that will allow the student adequate opportunity for independent study during his senior year. Satisfactory completion of a comprehensive examination must be fulfilled prior to May 1 of the quarter of graduation.

The following courses are the required core for all majors and minors in biology:

Biol 1-105, 1-106—General Biology (5)
 Biol 1-107, 1-108—General Biology (5)
 Biol 3-153—Principles of Genetics (3)

Biol 3-243—Cellular Biology (5)
 Biol 3-773—General Ecology (3)

Total (21)

Supporting Courses Required (for all majors and minors)—10 credits of general chemistry, 5 credits of organic chemistry or the equivalent, and 5 credits of college mathematics (excluding Math 3-030). Students with 4 years of high school mathematics may petition the department for exemption. Since the chemistry and mathematics are prerequisite to many courses in biology, students are urged to complete these supporting courses during the freshman and sophomore years.

In addition to the required supporting courses, 1 year of college physics and mathematics through calculus are strongly recommended.

MAJOR IN BIOLOGY FOR THE B.A. AND B.S. DEGREES

Biological sciences core (21)

Biol 3-774—General Ecology Laboratory (2)

Biol 3-960—Seminar (1)^{oo}

Electives in biology courses numbered 3-000 and above (26 or 27)

Total (50)

For teacher certification, majors must complete a minimum of two courses in plant sciences and two courses in animal sciences from the elective category.

Students planning on graduate school should consult graduate school bulletins for foreign language and other requirements.

^{oo} Not required for majors who complete teacher certification.

MINOR IN BIOLOGY FOR THE B.A. AND B.S. DEGREES

Biological sciences core (21)

Electives in biology courses numbered 3-000 and above (9)

Total (30)

COURSES

- 1-001. ELEMENTS OF MICROBIOLOGY.** (4 cr; open to home economics majors, student nurses, dental hygiene students, par nursing, and certain preprofessional students; 2 hrs lect, 4 hrs lab)
Microbes that affect our health.
- 1-003. BIOLOGY FOR ELEMENTARY EDUCATION.** (4 cr, §1-105 or §1-107; prereq elementary education major, Chem 1-108 or §; 3 hrs lect, 2 hrs lab)
Subject matter background for effective teaching at the elementary school level.
- 1-009. UPSIDE DOWN BIOLOGY.** (5 cr; open to freshmen only, other students with §; 3 hrs discussion, 4 hrs lab)
Analysis of experiments, procedures, and papers written by biologists to give the student an understanding of how biologists and other scientists create knowledge.
- 1-011. HUMAN ANATOMY.** (4 cr; primarily for students preparing for nursing, dental hygiene, medical technology, and physical education; 2 hrs lect, 4 hrs lab)
Gross and microscopic structure of the human body from a functional standpoint utilizing charts, models, and skeletons; cat dissection to demonstrate mammalian anatomy.
- 1-041. HUMAN PHYSIOLOGY.** (4 cr; primarily for students preparing for nursing, dental hygiene, preprofessional programs, and physical education; prereq 1 qtr chemistry or §; 2 hrs lect, 4 hrs lab)
Organ systems of the human body. Laboratory work includes graphic recording of muscle contraction, heartbeat, and respiration; experiments in digestion, urinalysis, and sensory organs. A brief histological study of each system is included.
- 1-061. DENDROLOGY.** (4 cr; 2 hrs lect, 4 hrs lab; offered when feasible)
Forest trees of the United States, their classification, characteristics, and range; lectures, field trips, assigned reading, laboratory.
- 1-102. BIOLOGY AND MAN.** (5 cr; 4 hrs lect, 2 hrs lab)
Principles of modern biology; origin and nature of life, genetics, eugenics, evolution, population dynamics, ecology, pollution, pesticides, radiation, drugs, and other problems of man in his environment.
- 1-105. GENERAL BIOLOGY.** (3 cr; prereq concurrent regis or prior cr in 1-106; 3 hrs lect)
Principles of zoology; animal form, function, evolution, and interrelationships.
- 1-106. GENERAL BIOLOGY LABORATORY.** (2 cr; prereq concurrent regis or prior cr in 1-105; 4 hrs lab)
Survey of the animal kingdom; principles of embryology, genetics, evolution, and taxonomy.
- 1-107. GENERAL BIOLOGY.** (3 cr; prereq concurrent regis or prior cr in 1-108; 3 hrs lect)
Principles of botany; structures and functions of plants; plant kingdom; evolution.
- 1-108. GENERAL BIOLOGY LABORATORY.** (2 cr; prereq concurrent regis or prior cr in 1-107; 4 hrs lab)
Microscopic and gross anatomy of plants; experiments in physiology; plant phylogeny with emphasis on life histories.
- 3-001. THE MICROBIAL WORLD.** (3 cr [no cr for majors or minors in dept], §5-403; prereq 5 cr general biology recommended; offered when feasible)
Microbiology for the nonscientist. Microbes that have contributed to recent knowledge in growth, disease, genetics, evolution, and ecology. Taped lectures followed by discussions.
- 3-153. PRINCIPLES OF GENETICS.** (3 cr; prereq 10 cr in general biology, college algebra or equiv; 3 hrs lect)
Basic principles of Mendelian inheritance and molecular genetics.

- 3-243. CELLULAR BIOLOGY.** (5 cr; prereq 10 cr in general biology and 5 cr in organic chemistry or §; 3 hrs lect, 6 hrs lab)
Chemical and physical properties of the living cell.
- 3-513. DEVELOPMENTAL BIOLOGY.** (5 cr; prereq 10 cr in general biology; 3 hrs lect, 4 hrs lab) Firling
Principles of animal and plant development, including: gametogenesis, fertilization, cleavage, gastrulation, organogenesis, embryonic adaptations, metamorphosis, regeneration, and plant growth and differentiation. Laboratory study of invertebrate and vertebrate morphogenesis with emphasis on amphibian, chick, and pig embryogenesis.
- 3-773. GENERAL ECOLOGY.** (3 cr; prereq 10 cr in general biology; may be taken without lab 3-774)
Introduction to the principles and theory of environmental biology; functional approach to ecosystems.
- 3-774. GENERAL ECOLOGY LABORATORY.** (2 cr; prereq concurrent regis or prior cr in 3-773; 3 hrs lab)
Experience in methods of measuring environmental factors, interpreting data.
- 3-960. SEMINAR.** (1 cr [may be repeated for a maximum of 3 cr]; prereq jr and Δ)
Readings and reports on classical and current literature in biology.
- 3-980. HONORS.** (1-3 cr [may be repeated for a maximum of 9 cr])
- 3-990. PROBLEMS.** (1-3 cr [may be repeated for a maximum of 9 cr]; prereq jr and Δ)
Advanced work in special fields.

All of the following biology courses except 5-051, 5-100, 5-444, 5-584, and 5-779 are "starred" courses which may be used by Graduate School students to satisfy the Master's degree 9-credit Plan B requirement of such courses. A student should consult with his adviser before registering for these courses.

- 5-051. HUMAN GENETICS.** (5 cr, §3-153; prereq 5 cr in general biology or §; 4 hrs lect, 2 hrs lab-discussion; will not satisfy requirements for major or minor in biology; offered summer only) Hedman
Fundamentals of genetics with emphasis on aspects of human genetics encountered in areas of education, psychology, and sociology.
- 5-100. BASIC BOTANY AND ZOOLOGY.** (1-9 cr)
To enable graduate students to make up certain deficiencies in background course work.
- 5-155. ORGANIC EVOLUTION.** (3 cr, §3-155; prereq 10 cr in general biology; 3 hrs lect) Hofslund
History, opposition, evidence, causes, and conclusions.
- 5-213. PLANT ANATOMY.** (5 cr; prereq 10 cr in general biology; 3 hrs lect, 4 hrs lab; offered 1973-74 and alt yrs) J Carlson
Origin, development, and structure of tissue systems of vegetative and reproductive organs of vascular plants.
- 5-215. HISTOLOGY.** (5 cr, §3-213; prereq 10 cr in general biology; 2 hrs lect, 6 hrs lab; offered when feasible)
Microscopic structure of the vertebrate body.
- 5-241. ANIMAL PHYSIOLOGY.** (5 cr; prereq 3-243 or §; 3 hrs lect, 4 hrs lab) Pozos
Principles of animal physiology with emphasis on structure-function relationships in mammalian organ systems.
- 5-243. CELL METABOLISM.** (5 cr; prereq college algebra and 3-243; 3 hrs lect, 6 hrs lab; offered 1972-73 and alt yrs) Hedman
Biological and biochemical aspects of selected topics in molecular biology.
- 5-253. BIOCHEMICAL GENETICS.** (3 cr; prereq 3-153 and 3-243; 3 hrs lect; offered 1973-74 and alt yrs) Hedman
Survey of current concepts concerning gene structure, gene regulation, and gene expression.
- 5-403. GENERAL MICROBIOLOGY.** (5 cr, §3-403; prereq 10 cr in general biology and 10 cr in chemistry or §...organic chemistry and cell biology recommended; 3 hrs lect, 6 hrs lab) Fluegel
Classical and current information on bacteria, viruses, yeasts, and other microorganisms.

Section 2—Major-Minor Requirements and Courses

- 5-411. MORPHOLOGY OF NONVASCULAR PLANTS.** (5 cr, §3-413; prereq 10 cr in general biology; 3 hrs lect, 4 hrs lab) J Carlson
Phylogeny, structure, and life histories of algae, fungi, mosses, and liverworts.
- 5-412. MORPHOLOGY OF VASCULAR PLANTS.** (5 cr, §3-414; prereq 10 cr in general biology; 3 hrs lect, 4 hrs lab) J Carlson
Phylogeny, structure, and life histories of ferns, fern allies, and seed plants.
- 5-413. GENERAL MYCOLOGY.** (4 cr; prereq organic chemistry or §; 2 hrs lect, 4 hrs lab; offered when feasible) Fluegel
Life histories, ecology, physiology, morphogenetic studies, control, and practical uses of the fungi.
- 5-421. PLANT DIVERSITY.** (5 cr, §5-411, §5-412; prereq 10 cr in general biology or §; 3 hrs lect, 4 hrs lab; offered summer only) J Carlson
Laboratory and field studies on the phylogeny, structure, and life histories of algae, fungi, mosses, ferns, fern allies, and seed plants; emphasis on Minnesota species.
- 5-443. PLANT PHYSIOLOGY.** (3 cr; prereq 3-243 or §...concurrent regis in 5-444 by undergrad students; 3 hrs lect; offered 1972-73 and alt yrs) Ahlgren
Study of plant function with emphasis on the higher plants. Biochemical and physical aspects of plants, their growth, nutrition, metabolism, and relationship to light, water, and other environmental factors. Research paper required of graduate students.
- 5-444. PLANT PHYSIOLOGY LABORATORY.** (2 cr; prereq concurrent regis in 5-443; 3 hrs lab; offered 1972-73 and alt yrs) Ahlgren
Experimental basis for interpretation of certain physiological phenomena in plants, research problems, methods, and techniques in plant physiology. Research problem required of graduate students.
- 5-461. PLANT TAXONOMY.** (5 cr, §3-463; prereq 10 cr in general biology; 3 hrs lect, 4 hrs lab) Monson
Introduction to taxonomy of vascular plants with emphasis on seed plants; representative families; terminology; literature; use of keys.
- 5-463. ADVANCED PLANT TAXONOMY.** (4 cr; prereq 5-461 or §; 3 hrs lect, 2 hrs lab; offered 1973-74 and alt yrs) Monson
Principles of plant classification; literature of systematic botany with emphasis on bibliographic tools; methods of collection, preservation, and study of vascular plants.
- 5-465. FLORA OF MINNESOTA.** (4 cr; prereq 5-461 or §; 2 hrs lect, 4 hrs lab; offered summer only) Monson
Collection, identification, classification, and relationships among flowering plants of the state.
- 5-467. AQUATIC FLOWERING PLANTS.** (3 cr; prereq 10 cr in botany or §; 2 hrs lect, 4 hrs lab; offered summer only) Monson
Higher plants of aquatic and marsh habitats; identification; adaptive morphology; food value to wild life.
- 5-514. PHYSIOLOGY OF DEVELOPMENT.** (5 cr; prereq 3-153, 3-513, 3-243; 3 hrs lect, 6 hrs lab) Firling
Selected topics in the analysis of development: biochemistry of fertilization, morphogenetic movements, induction, cell differentiation, gene expression and control mechanisms. Laboratory study of growth and differentiation using tissue culture, autoradiographic, cytological, and biochemical techniques.
- 5-515. COMPARATIVE ANATOMY OF INVERTEBRATES.** (5 cr, §3-515; prereq 10 cr in general biology; 2 hrs lect, 6 hrs lab; offered 1973-74 and alt yrs) Krogstad
Review of the invertebrate groups with emphasis on morphology and phylogeny.
- 5-517. COMPARATIVE ANATOMY OF VERTEBRATES.** (5 cr, §3-517; prereq 10 cr in general biology; 3 hrs lect, 4 hrs lab) Odlaug
Review of vertebrate groups with emphasis on phylogeny.
- 5-523. NATURAL HISTORY OF INVERTEBRATES.** (4 cr, §3-523; prereq 10 cr in general biology; 2 hrs lect, 4 hrs lab and field) Krogstad
Collection, identification, life histories, and ecological relationships of local invertebrates; emphasis on aquatic species.
- 5-524. NATURAL HISTORY OF VERTEBRATES.** (4 cr, §3-524; prereq 10 cr in general biology or §; 2 hrs lect, 4 hrs lab) Hofslund
The way of life of vertebrate animals, including the study of their origins, principles of taxonomy, population dynamics, and adaptations to living within their environment.

- 5-526. ICHTHYOLOGY.** (4 cr, §3-526; prereq general ecology or §; 2 hrs lect, 4 hrs lab)
H Collins
Physiologic, taxonomic, ecologic, economic, and behavioral aspects of fishes. Laboratory emphasis on fishes of the Great Lakes Region including field-conducted independent study.
- 5-527. ORNITHOLOGY.** (5 cr, §3-527; prereq 10 cr in general biology; 3 hrs lect, 5 hrs lab and field) Hofslund
Laboratory and field identification of birds, their migration and habitats; biological, taxonomic, and economic considerations.
- 5-528. MAMMALOLOGY.** (4 cr, §3-528; prereq general ecology or §; 2 hrs lect, 4 hrs lab; offered 1972-73 and alt yrs) H Collins
Origin, taxonomy, distribution, physiology, ecology, and behavior of mammals; laboratory and field work in techniques of collecting, preparing specimens, and identification of Minnesota species. Independent field project on mammal ecology.
- 5-561. INTRODUCTORY ENTOMOLOGY.** (5 cr, §3-563; prereq 10 cr in general biology; 2 hrs lect, 6 hrs lab and field) Krogstad
Structure, life history, ecology, classification, evolution, principles of control, and the significance of insects in our society. Field collections.
- 5-562. ADVANCED INSECT BIOLOGY.** (4 cr, §5-563; prereq 5-561; 2 hrs lect, 4 hrs lab and field; offered 1972-73 and alt yrs) Krogstad
Studies in specific areas such as insect parasitism, distribution, diapause, and immature insects. Independent laboratory and field problems.
- 5-564. ANIMAL PARASITOLOGY.** (5 cr, §3-565; prereq 10 cr in general biology; 3 hrs lect, 4 hrs lab) Odlaug
Common protozoan, worm, and arthropodan parasites of vertebrates; parasites considered from taxonomic, morphological, and physiological viewpoints; methods of transfer from host to host, symptoms of parasitic diseases, economic importance to man, and general methods of control; laboratory techniques useful in determining the presence of parasites.
- 5-565. HELMINTHOLOGY.** (3 cr; prereq 5-564 or §; 2 hrs lect, 4 hrs lab; offered 1972-73 and alt yrs) Odlaug
Worm parasites of man and other animals, their structure, life histories, and biological relationships.
- 5-573. FISH BIOLOGY.** (4 cr; prereq 5-526; 2 hrs lect, 4 hrs lab; offered 1972-73 and alt yrs) H Collins
Biology of fish populations. Analysis of problems concerned with commercial and sport fisheries and their management. Laboratory analysis of methods for studying fish growth, food habits, population estimation, and mortality rates. Field trips.
- 5-575. ECOLOGY OF BIRDS.** (4 cr; prereq 5-527; 2 hrs lect, 4 hrs lab) Hofslund
Relationships of birds to their environment. Individual and group field and laboratory studies with an introduction to specific ornithological techniques.
- 5-583. ANIMAL BEHAVIOR.** (3 cr; prereq 10 cr in general biology; 3 hrs lect) H Collins
Description of the known behavior of the various vertebrate and invertebrate phyla with emphasis on adaptive significance and the genetics and ontogeny of behavioral patterns. Special attention will be focused on mating, aggressive, nutritive, and nurturing behavior. Behavior related to ecology of animal populations will be presented.
- 5-584. ANIMAL BEHAVIOR LABORATORY.** (2 cr; prereq concurrent regis or prior cr in 5-583; 4 hrs lab) H Collins
Laboratory analysis of animal behavior. Student projects will be assigned for demonstration of behavior principles.
- 5-771. FRESHWATER ECOLOGY.** (3 cr, §5-773; prereq 10 cr in general biology and general chemistry or §; offered summer only) H Collins
Analysis of freshwater lake and stream ecosystems. Laboratory and field examination of aquatic communities. Interrelationships of biological, physical, and chemical parameters.
- 5-772. ECOLOGY OF MINNESOTA I.** (10 cr; prereq 10 cr in general biology and §; offered summer only, 8:00-5:00 MTWThF for 4 wks) H Collins, Monson
Biology of the prairie, mixed hardwood forest, boreal forest, and transition zones including both aquatic and terrestrial ecosystems. A mobile laboratory will be utilized.
- 5-773. LIMNOLOGY.** (4 cr; prereq general chemistry, 10 cr in general biology and 5-411 or 5-523; 2 hrs lect, 4 hrs lab; offered 1973-74 and alt yrs) H Collins
Biological, chemical, and physical aspects of lakes and streams. Extensive laboratory

Section 2—Major-Minor Requirements and Courses

and field analysis of the ecological relationships between aquatic organisms and their environment.

- 5-775. PLANT ECOLOGY.** (5 cr; prereq 3-243, 3-773, 5-461, and college algebra; 3 hrs lect, 4 hrs lab; offered 1972-73 and alt yrs)
Plant-environment relationships; local and North American communities; succession; abiotic factors and their measurement.
- 5-777. ECOLOGY OF ANIMAL POPULATIONS.** (3 cr; prereq 3-773 and #; 3 hrs lect; offered 1973-74 and alt yrs) Krogstad
Concepts of population structure, growth, competition, predator-prey relationship, life tables, and sampling; review of current literature.
- 5-779. ECOLOGY OF ANIMAL POPULATIONS LABORATORY.** (2 cr; prereq concurrent regis in 5-777 or #; 4 hrs lab; offered 1973-74 and alt yrs) Krogstad
Laboratory, field, and independent studies in animal populations.
- 5-801. MICROTECHNIQUE.** (4 cr, §3-801; prereq 10 cr in general biology and #; 2 hrs lect, 6 hrs lab ar; offered 1973-74 and alt yrs) J Carlson
Methods of preparing materials for microscopic study; freehand and paraffin procedures; practice in methods of fixation, sectioning and staining of botanical and zoological materials; principles of photomicrography.
- 8-960. GRADUATE SEMINAR.** (1-3 cr; prereq Δ)
Reports on recent developments in biology and on research projects in the department.
- 8-990. GRADUATE RESEARCH.** (Cr ar; prereq #)

BUSINESS ADMINISTRATION (BA)

Advisers—Professors Dettmann, Sielaff, Sorensen; Associate Professors Friest, Kim; Assistant Professors Boyer, Curtis, Tallent; Instructors Breu, Erkkila, Vigen, Vranesh

BACHELOR OF BUSINESS ADMINISTRATION DEGREE PROGRAM

Advisers—Professors Dettmann, Sielaff, Sorensen; Associate Professors Friest, Kim; Assistant Professors Boyer, Curtis, Tallent; Instructors Breu, Vranesh

A student who has no knowledge of data processing should enroll in BA 1-204 (Introduction to Data Processing) during his freshman or sophomore year.

A. PREBUSINESS REQUIREMENTS

Engl 1-106/1-107—Freshman Composition (8)
Liberal Education category 1 courses:
Math 1-153/1-154/1-155—Interdisciplinary Mathematics I, II, III (12)
Spch 1-101—Rhetoric of Our Times (3)
Liberal Education category 2 courses:
Electives (9)
Liberal Education category 3 courses:
Econ 1-004/1-005—Principles of Economics: Micro and Macro (8)
Psy 1-003—General Psychology (5)
Soc 1-100—Problems of American Society (5)

B. BUSINESS CORE

BA 3-101—Business Law: Contracts and Sales (3)
BA 3-204—Quantitative Methods I (5)

Liberal Education category 4 courses:

Electives (9)

Additional prebusiness requirements:

BA 1-104—Business Communications (3)

BA 1-504—Accounting Applications (4)

BA 1-505—The Accounting Process (4)

Econ 1-203—Statistical Methods (4)

Econ 1-204—Quantitative Research Methods (4)

Elective Liberal Education subjects in geography, history and political science (14)

Total (92)

BA 3-241—Systems Analysis I (3)

BA 3-301—Production Management (3)

BA 3-304—Fundamentals of Management (3)

BA 3-361—Business Policy (5)
BA 3-512—Managerial Accounting (4)
BA 3-601—Corporation Finance (3)

C. REQUIRED UPPER DIVISION NONBUSINESS COURSES

Econ 3-111—Microeconomic Analysis (5)
Econ 3-112—Macroeconomic Analysis (5)
Psy 3-704—Industrial and Business
Psychology (3)

D. ADDITIONAL UPPER DIVISION NONACCOUNTING BUSINESS COURSES

Minimum electives in nonaccounting business administration subjects (12)

Total (12)

Total Minimum Credits—Bachelor of Business Administration Degree (182)

BA 3-701—Principles of Marketing (3)
BA 3-804—Personnel Administration (3)

Total (35)

Soc 3-170—General Social Psychology (4)
7 additional credits to be selected from the following: Psy 3-211, 3-531, 3-611, 3-701, 3-821; PsyF 5-831; Soc 3-180, 3-190

Total (24)

E. UPPER DIVISION COURSES, ANY DEPARTMENT

Minimum electives, with a maximum of two courses in any one department (12)

Total (12)

MINOR IN BUSINESS ADMINISTRATION FOR THE B.A. DEGREE

This minor is not available to candidates for the B.B.A. or B.Ac. degrees. A student having no knowledge of data processing should enroll in BA 1-204 (Introduction to Data Processing) during his freshman or sophomore year.

SUPPORTING COURSES REQUIRED

Econ 1-004/1-005—Principles of Economics: Micro and Macro (8)
Econ 1-203—Statistical Methods (4)
Math 1-153/1-154/1-155—Interdisciplinary Mathematics I, II, and III (12)

Total (24)

BA 3-301—Production Management (3)
BA 3-304—Fundamentals of Management (3)

BA 3-601—Corporation Finance (3)
BA 3-701—Principles of Marketing (3)
BA 3-804—Personnel Administration (3)
Minimum electives in Upper Division business administration courses (7)

Total (30)

BUSINESS COURSES REQUIRED

BA 1-504—Accounting Applications (4)
BA 1-505—The Accounting Process (4)

BACHELOR OF ACCOUNTING DEGREE PROGRAM

Advisers—Professors Dettmann, Sorensen; Associate Professor Friest; Assistant Professors Curtis, Tallent; Instructor Vranesh

A student who has no knowledge of data processing should enroll in BA 1-204 (Introduction to Data Processing) during his freshman or sophomore year.

A. PREBUSINESS REQUIREMENTS

Engl 1-106/1-107—Freshman Composition (8)

Liberal Education category 1 courses:
Math 1-153/1-154/1-155—Interdisciplinary Mathematics I, II, III (12)

Spch 1-101—Rhetoric of Our Times (3)
Liberal Education category 2 courses:
Electives (9)

Liberal Education category 3 courses:
Econ 1-004/1-005—Principles of Economics: Micro and Macro (8)

Psy 1-003—General Psychology (5)
Soc 1-100—Problems of American Society (5)

Liberal Education category 4 courses:

Electives (9)

Additional prebusiness requirements:

BA 1-104—Business Communications (3)
BA 1-504—Accounting Applications (4)
BA 1-505—The Accounting Process (4)
Econ 1-203—Statistical Methods (4)
Econ 1-204—Quantitative Research Methods (4)

Elective Liberal Education subjects in geography, history, and political science (14)

Total (92)

Section 2—Major-Minor Requirements and Courses

B. BUSINESS CORE

- BA 3-101—Business Law: Contracts and Sales (3)
- BA 3-102—Negotiable Instruments; Property Law (3)
- BA 3-204—Quantitative Methods I (5)
- BA 3-241—Systems Analysis I (3)
- BA 3-301—Production Management (3)
- BA 3-304—Fundamentals of Management (3)
- BA 3-361—Business Policy (5)
- BA 3-601—Corporation Finance (3)
- BA 3-701—Principles of Marketing (3)
- BA 3-804—Personnel Administration (3)

Total (34)

C. REQUIRED UPPER DIVISION ACCOUNTING COURSES

- BA 3-501—Intermediate Accounting I (4)
- BA 3-502—Intermediate Accounting II (4)
- BA 3-507—Cost Accounting (4)
- BA 3-544—Income Tax Accounting (4)
- BA 3-546—Auditing (4)
- BA 3-548—Accounting Problems (4)

Total Minimum Credits—Bachelor of Accounting Degree (190)

Minimum electives in accounting subjects (3)

Total (27)

D. REQUIRED UPPER DIVISION NON-BUSINESS COURSES

- Econ 3-111—Microeconomic Analysis (5)
- Econ 3-112—Macroeconomic Analysis (5)
- Fsv 3-704—Industrial and Business Psychology (3)
- Soc 3-170—General Social Psychology (4)
- 7 additional credits to be selected from the following: Psy 3-211, 3-531, 3-611, 3-701, 3-821, PsyF 5-831; Soc 3-180, 3-190

Total (24)

E. UPPER DIVISION COURSES, ANY DEPARTMENT

Minimum electives, with a maximum of two courses in any one department (9)

Total (9)

MINOR IN ACCOUNTING FOR THE B.A. DEGREE

This minor is not available to candidates for the B.Ac. degree. A student having no knowledge of data processing should enroll in BA 1-204 (Introduction to Data Processing) during his freshman or sophomore year.

SUPPORTING COURSES REQUIRED

- Econ 1-004/1-005—Principles of Economics: Micro and Macro (8)
- Econ 1-203—Statistical Methods (4)
- Math 1-153/1-154/1-155—Interdisciplinary Mathematics I, II and III (12)

Total (24)

ACCOUNTING COURSES REQUIRED

- BA 1-504—Accounting Applications (4)
- BA 1-505—The Accounting Process (4)
- BA 3-501—Intermediate Accounting I (4)
- BA 3-507—Cost Accounting (4)
- Minimum electives in Upper Division accounting courses (8)

Total (24)

MINOR IN ACCOUNTING FOR THE B.S. DEGREE

This minor is not available to candidates for the B.Ac. degree.

SUPPORTING COURSES REQUIRED

- Econ 1-004/1-005—Principles of Economics: Micro and Macro (8)
- Econ 1-203—Statistical Methods (4)
- Math 1-153/1-154—Mathematics I and II (8)

Total (20)

- BA 1-504—Accounting Applications (4)
- BA 1-505—The Accounting Process (4)
- BA 3-501—Intermediate Accounting I (4)
- BA 3-507—Cost Accounting (4)
- SeEd 3-265—Methods of Teaching Bookkeeping (1)

Minimum electives in accounting or type-writing courses (8)

Total (28)

ADDITIONAL COURSES REQUIRED

- BA 1-204—Introduction to Data Processing (3)

This program is recommended for students seeking certification to teach bookkeeping or accounting subjects in secondary schools. To be qualified for

additional certification to teach typewriting, a student must also complete BA 1-043 (Production Typewriting) or equivalent, and SeEd 3-263 (Methods of Teaching Typewriting).

MAJOR IN BUSINESS EDUCATION FOR THE B.S. DEGREE

Advisers—Professors Dettmann, Sielaff; *Instructors* Erkkila, Vigen

BA 1-041/1-042/1-043—Production Typewriting (6)
 BA 1-047/1-048—Intermediate Shorthand (6)
 BA 1-049—Advanced Shorthand; Transcription (3)
 BA 1-051—Secretarial Procedures (3)
 BA 1-104—Business Communications (3)
 BA 1-201—Calculating Equipment (1)
 BA 1-204—Introduction to Data Processing (3)
 BA 1-504—Accounting Applications (4)
 BA 1-505—The Accounting Process (4)
 BA 3-001—Administrative Services Management (3)
 BA 3-004—Business and Economics Education (2)
 BA 3-101—Business Law: Contracts and Sales (3)
 BA 3-304—Fundamentals of Management (3)

BA 3-701—Principles of Marketing (3)
 Econ 1-004/1-005—Principles of Economics: Micro and Macro (8)
 Electives in Upper Division accounting courses (4)
 Electives in Upper Division business administration courses—selected with adviser (5)
Total (64)

SUPPORTING COURSES REQUIRED

SeEd 3-263—Methods of Teaching Typewriting (1)
 SeEd 3-265—Methods of Teaching Bookkeeping (1)
 SeEd 3-267—Methods of Teaching Shorthand (1)
Total (3)

This program is required for students seeking comprehensive certification to teach business subjects in secondary schools.

Students planning to major in business education must have had prior course work in elementary typewriting and elementary shorthand before entering UMD, or make arrangements for such preparation elsewhere while attending UMD.

TWO-YEAR PROGRAM IN SECRETARIAL SCIENCES FOR THE A.A. DEGREE

Liberal Education requirements, including:

BA 1-041/1-042/1-043—Production Typewriting (6)
 BA 1-047/1-048—Intermediate Shorthand (6)
 BA 1-049—Advanced Shorthand; Transcription (3)
 BA 1-051—Secretarial Procedures (3)
 BA 1-104—Business Communications (3)

BA 1-201—Calculating Equipment (1)
 BA 1-204—Introduction to Data Processing (3)
 BA 1-504—Accounting Applications (4)
 BA 1-505—The Accounting Process (4)
 Econ 1-004/1-005—Principles of Economics: Micro and Macro (8)

Total (90)

Students enrolling in this secretarial sciences program must have had prior course work in elementary typewriting and elementary shorthand before entering UMD, or make arrangements for such preparation elsewhere while attending UMD.

COURSES

1-041/1-042/1-043. PRODUCTION TYPEWRITING. (2 cr each; prereq 1 yr recent high school typewriting or equiv; placement by exam; 4 hrs lect-lab)
 Advanced letter forms; tabulation problems; office forms; manuscripts; stencils; footnotes; bibliographies; proofreading; voice-writing equipment; and electric typewriters.

Section 2—Major-Minor Requirements and Courses

- 1-047/1-048. INTERMEDIATE SHORTHAND.** (3 cr each; prereq 1 yr recent high school shorthand or equiv; placement by exam; 5 hrs lect-lab)
Development of speed and accuracy in taking dictation.
- 1-049. ADVANCED SHORTHAND; TRANSCRIPTION.** (3 cr; prereq 1-048; 5 hrs lect-lab)
Emphasis on transcription and advanced vocabulary development.
- 1-051. SECRETARIAL PROCEDURES.** (3 cr; open only to business education majors and to others requiring course in major or minor; prereq jr, 1-041, or #; offered 1972-73 and alt yrs)
Training in secretarial duties; basic indexing and filing problems; editing and revising correspondence; communications; reference materials; intraoffice relationships.
- 1-101. BUSINESS AND ITS ENVIRONMENT.** (3 cr; not open to Upper Division accounting, business administration, or economics majors or minors; offered when feasible)
Business as a part of a larger system—economic, political, social. Special emphasis on the external environment—economics, culture, government, technology, international relations, labor—within which business operates. Social responsibility.
- 1-104. BUSINESS COMMUNICATIONS.** (3 cr; open only to majors and minors in business administration, accounting, business education, and secretarial science; prereq Engl 1-106/1-107, Spch 1-101, or #)
Application of effective communication techniques in business through an analysis and study of the form and style of business letter writing; writing of business reports with emphasis on organization of material and clear effective presentation of thought.
- 1-201. CALCULATING EQUIPMENT.** (1 cr; open only to business education majors and to others requiring course in major; 2 hrs lect-lab)
Functions and operation of calculating equipment.
- 1-204. INTRODUCTION TO DATA PROCESSING.** (3 cr)
Emphasis on peripheral computer equipment, electronic calculators and computers, and an introduction to a programming language.
- 1-504. ACCOUNTING APPLICATIONS.** (4 cr, §1-501; prereq 3rd qtr fr or #)
The uses of accounting information inside and outside of the accounting entity; its relationship to the nature and objectives to the entity; managerial and nonmanagerial uses of accounting reports; basic principles and procedures for recording business transactions.
- 1-505. THE ACCOUNTING PROCESS.** (4 cr, §1-502 or §1-543; prereq 1-504)
The measurement of accounting income; development of accounting reports; preparation of financial statements; effect of price-level changes; evaluation of assets, liabilities, and equities.
- 3-001. ADMINISTRATIVE SERVICES MANAGEMENT.** (3 cr; open only to business education majors and to others requiring course in major or minor; prereq 1-051 or #; offered 1973-74 and alt yrs)
Application of management principles to the administrative services of the enterprise including communications; records, procedures analysis, and methods study; forms design and control; personnel; quantity and quality standards; equipment selection; work flow; layout and environment.
- 3-004. BUSINESS AND ECONOMICS EDUCATION.** (2 cr; open only to business and economic education majors; prereq #; offered 1972-73 and alt yrs)
Introductory survey of the fields of basic business, economic, office, and distributive education at different educational levels; guidance, professional development, legislation, trends, and similar topics applicable to all areas of business education.
- 3-101. BUSINESS LAW: CONTRACTS AND SALES.** (3 cr)
Law of contracts and sales.
- 3-102. NEGOTIABLE INSTRUMENTS; PROPERTY LAW.** (3 cr; prereq 3-101)
Law of negotiable instruments. Property rights and obligations. Real and personal property law.
- 3-103. ORGANIZATION LAW; TRUSTS AND WILLS.** (3 cr; prereq 3-101)
Law of agency and a consideration of problems of partnerships and corporations; trusts and wills.
- 3-204. QUANTITATIVE METHODS I.** (5 cr, §3-201; prereq prebusiness or #)
Application of basic mathematical and statistical techniques to the various functional areas of the business curricula.

- 3-211. MANAGEMENT INFORMATION SYSTEMS.** (4 cr, §3-541; prereq prebusiness or #)
Analysis, design, and operation of information systems for management with major emphasis on computer-based systems, their design and introduction, and behavioral implications.
- 3-241. SYSTEMS ANALYSIS I.** (3 cr; prereq 3-204 or #)
Simulation techniques for use in the planning of business firms and in controlling the firms' business activities.
- 3-242. SYSTEMS ANALYSIS II.** (3 cr; prereq 3-241 or #; offered when feasible)
Design of large-scale simulation models for analytical and predictive purposes.
- 3-301. PRODUCTION MANAGEMENT.** (3 cr; prereq prebusiness or #)
Techniques, managerial problems, and decision-making processes in planning and controlling the production activity. Research and development, standards, physical facilities, work measurement, materials control, quality control, production planning.
- 3-304. FUNDAMENTALS OF MANAGEMENT.** (3 cr; prereq prebusiness or #)
The principal functional areas of management: planning, organizing, staffing, directing, and controlling. Examines attributes of good organization; establishment of goals, policies, and procedures; control systems and techniques; providing necessary factors and relationships to achieve organizational objectives.
- 3-341. PRODUCTION CONTROL AND PLANNING.** (3 cr; prereq 3-204, 3-241, 3-301, 3-601 or #; offered when feasible)
Production scheduling techniques, preparation of new equipment proposals, statistical forecasting techniques, and quality control.
- 3-351. SMALL BUSINESS MANAGEMENT.** (5 cr; prereq sr, 3-301, 3-304, 3-601, 3-701, 3-804 or #; offered when feasible)
An integrating course to examine problems associated with small businesses, develop skill in evaluation of management goals and policies, and require participation in a community-based project. The format includes analysis and discussion of relevant cases, a computerized business game, and a group project.
- 3-361. BUSINESS POLICY.** (5 cr; prereq sr, 3-301, 3-304, 3-601, 3-701, 3-804 or #)
Integration of the subject matter of required courses in business administration, economics, and the behavioral sciences, through study of the problems of top management organization, administrative techniques, and policy formulation. Cases are used as the basis for class discussion. Written reports and oral presentations are required.
- 3-374. INTERNSHIP IN MANAGEMENT.** (5 cr; open only to sr business administration majors; prereq Business Core, except 3-361, and Δ)
The student will work full time for 1 quarter or 2 summer sessions in all managerial areas and aspects in an approved program within a public agency, private business, or other organization. Written and oral reports of the student's activities will be required.
- 3-404. RISK MANAGEMENT AND INSURANCE.** (4 cr, §3-401; prereq prebusiness or #; offered when feasible)
Recognition, measurement, and evaluation of risk with particular emphasis upon insurable risks and insurance. Application to the property, liability, and personal risks of firms and families. Risk management function in business and its relationship to other business management functions. Public policy and risk management, social insurance, and government regulation of insurance.
- 3-501. INTERMEDIATE ACCOUNTING I.** (4 cr, §5-501; prereq prebusiness or #)
The search for principles and postulates of accounting, with emphasis on the timing of revenue recognition and expense matching; concepts of income, and the impact of inventory measurement on its determination.
- 3-502. INTERMEDIATE ACCOUNTING II.** (4 cr, §5-502 and §5-503; prereq 3-501 or #)
Application of concepts examined in BA 3-501 to all traditional balance sheet components; and a probing of possible future changes in the reporting of financial condition and results of operations of business firms, with a view toward providing more useful information to the firm and its many publics.
- 3-507. COST ACCOUNTING.** (4 cr, §5-507; prereq prebusiness or #)
Practices, principles, and procedures of handling production costs for use in inventory valuation and income determination. Applications of cost information in management decision making.
- 3-512. MANAGERIAL ACCOUNTING.** (4 cr, §3-511 or §3-507; prereq prebusiness and sr standing or #)
Use of accounting data by management in planning and controlling business activities: Application of quantitative techniques in management decision making.

Section 2—Major-Minor Requirements and Courses

- 3-514. FUND ACCOUNTING I.** (3 cr; prereq 1-505 or #)
Fund, budget, municipal, and governmental accounting examined for needs of administration and management of governmental units and other not-for-profit organizations.
- 3-544. INCOME TAX ACCOUNTING.** (4 cr, §5-521 or §5-522; prereq 3-501 or #)
Principles involved in determining taxable net income and computation of federal and state income taxes. Individual and corporation taxes are emphasized.
- 3-546. AUDITING.** (4 cr, §5-524 and/or §5-525; prereq 3-502 and sr accounting major, or #)
Theory and procedures in the audit process and completion of an audit case.
- 3-548. ACCOUNTING PROBLEMS.** (4 cr, §5-527; prereq 3-502 and sr accounting major, or #)
A study of accounting problems including areas of partnerships, consolidated financial statements, price-level changes, present-value concepts, businesses in financial difficulties, fiduciary and governmental accounting.
- 3-572. INTERNSHIP IN PUBLIC ACCOUNTING.** (5 cr, §3-571; open only to sr accounting majors; prereq 3-546 and Δ)
Student will work full time for 1 quarter in a public accounting firm. Extensive written reports of student's activities, by both the student and employing firm, will be required.
- 3-575. INTERNSHIP IN INTERNAL ACCOUNTING.** (5 cr, §3-574; open only to sr accounting majors; prereq 3-502, 3-507 and Δ)
Student will work full time for 1 quarter in private industry (profit or nonprofit) or in a governmental unit, in an accounting program first approved by the UMD accounting faculty. Extensive written reports of student's activities, by both the student and employing unit, will be required.
- 3-601. CORPORATION FINANCE.** (3 cr; prereq prebusiness or #)
Principles governing the planning, raising, and control of short- and long-term funds for business enterprise. Cash flow, valuation, capital structures, investment banking, dividend policy, mergers, and reorganizations.
- 3-644. INVESTMENT FUNDAMENTALS.** (4 cr, §3-641; prereq 3-601 or #)
A comprehensive introduction to the nature, problems, and process of evaluating particular securities and portfolio construction and administration. A survey of basic principles of security analysis, analytical techniques, and investment policy for the individual and institutional investors.
- 3-647. FINANCIAL MARKETS AND INSTITUTIONS.** (4 cr, §3-651; prereq 3-601 or #)
Analysis of the structure and functions of the money and capital markets, the savings-investment process and financial institutions. Role of the Federal Reserve and Treasury in financial market development, supply and demand for loanable funds, and interrelationship of financial markets; the level and structure of interest rates.
- 3-701. PRINCIPLES OF MARKETING.** (3 cr; prereq prebusiness or #)
Social, economic, legal, and other environmental aspects of marketing. Special emphasis on the changing environment and the resulting impact on marketing strategy and marketing policies including product development, pricing, marketing channels, and promotion.
- 3-724. INTERNATIONAL BUSINESS.** (4 cr, §3-721; prereq prebusiness or #)
Broad study of the major forms of international business; the impact of international economic and nationalistic government policies on the formation of international trade patterns and marketing decisions, comparative managerial marketing functions, trade procedures, and international transfer of payments.
- 3-734. TRANSPORTATION LOGISTICS.** (4 cr, §3-731; prereq prebusiness and Econ 3-042 or #; offered when feasible)
Organization and control of transportation and storage services of the firm. Transportation alternatives, documentation, cost levels, customer service, warehousing, and the logistics concept.
- 3-741. SALES MANAGEMENT.** (4 cr, §5-701; prereq 3-701 or #)
Determination of sales policies, sales organization, the selection, training, and compensation of salesmen, the control of sales performance and sales budgets in industrial, wholesale, and business service organizations. Behavioral approaches to selling and sales organizations.
- 3-743. ADVERTISING ISSUES.** (4 cr, §5-711; prereq 3-701 or #)
Business and social issues in the development of advertising. History of advertising, economics of advertising, advertising psychology, selection of copy and media, advertising research, government regulation.

- 3-747. RETAIL MANAGEMENT.** (4 cr, §5-714; prereq 3-701 or #)
Changing roles and policies of retail institutions. Advent of large-scale and self-service retailing and its implications.
- 3-804. PERSONNEL ADMINISTRATION.** (3 cr, §3-841; prereq prebusiness or #)
Personnel management and labor relations in development and utilization of effective work teams. Overview of policy and practice in major manpower management functions of staffing, training, communications, motivation, compensation, and morale maintenance.
- 3-807. WAGE AND EMPLOYMENT ANALYSIS.** (4 cr, §3-801; prereq prebusiness or #)
An analysis of the interrelationships between labor productivity, wages, prices, and levels of employment. Classical and current thought will be contrasted against the backdrop of government legislative and judicial policies.
- 3-821. HUMAN RELATIONS IN ADMINISTRATION.** (4 cr, §3-844 and §IR 3-010; prereq prebusiness or #)
Application of basic human relations techniques to managerial situations in decision making and superior-subordinate relationships. Consideration of human factors of listening, motivation, frustration, attitudes, delegation, morale, boredom, group discussion techniques, and performance appraisal through role playing and case study.
- 3-842. LABOR RELATIONS.** (4 cr, §IR 3-007; prereq 3-804 or #)
Contractual relationships between employers and/or employer associations and unions. Relevant policies of employers, unions, and the public; background of the labor movement with emphasis on development of current labor law; current practices in labor relations; and significant trends.
- 3-845. COLLECTIVE BARGAINING: THE PROCESS.** (4 cr, §IR 3-017; prereq 3-842 or #)
Systems approach to examination of the collective bargaining process in terms of its functions, variants, determinants, practices, and impacts. Public and private approaches to preparation and conduct of collective bargaining. Collective bargaining as method of resolving conflict.
- 3-970. INDEPENDENT STUDY.** (1-3 cr; prereq Δ)
For students wishing to do special work in a business administration area that extends beyond, or in greater depth than, regular course offerings.
- 5-364. MANAGEMENT ISSUES AND CONCEPTS.** (3 cr; prereq sr, 3-304 and #)
Past and present contributions to the development of management thought and practice.
- 5-508. COST ACCOUNTING II.** (3 cr; prereq 3-507 or #)
Use of cost information in managerial decision making.
- 5-541. READINGS IN ACCOUNTING LITERATURE.** (3 cr; prereq sr, 24 cr in accounting or #; offered when feasible)
Discussion and reports on selected topics in practice and theory as found in current accounting literature.
- 5-542. ADVANCED ACCOUNTING PROBLEMS.** (3 cr; prereq sr, accounting major, 3-548 or #; offered when feasible)
Study of special problem areas in the field of accounting, with emphasis upon the implication of income, valuation, cost, and taxes on business organizations.
- 5-717. MARKETING MANAGEMENT.** (3 cr; prereq 3-701 or #; offered when feasible)
Marketing policy issues. Coordination of advertising, sales development, and other aspects of the total marketing program.

CHEMISTRY (Chem)

Advisers—Professors Bydalek, Cowles, Duval, Moore, Nichol, L. Thompson; Associate Professors P. Anderson (School of Medicine—Duluth), Caple, R. M. Carlson, F. Glick, Harriss; Assistant Professors Magnuson, Salo

See Section 4 for master of science degree program in chemistry.

Under certain circumstances, some substitutions in majors and minors are permitted by consent of the department.

Section 2—Major-Minor Requirements and Courses

Honors Program—Qualified chemistry majors are selected at end of sophomore year. Average grades must be 3.25 in chemistry and 3.00 overall. Major adviser, in consultation with Departmental Honors Committee, assists students in planning basic program including Chem 3-191, other advanced courses beyond major curriculum, and comprehensive oral examination early in spring quarter of senior year. See department head for further details.

Students intending to teach chemistry in high school may elect either the B.A. or B.S. degree program in chemistry. Students who major in chemistry and who plan to teach are encouraged to choose minors in related fields in which they are likely to teach (biology, geology, mathematics, physics).

MAJOR IN CHEMISTRY FOR THE B.A. DEGREE

Chem 1-110/1-111/1-112—General Chemistry (15)	Chem 5-410/5-411—Inorganic Chemistry (5)
(or) Chem 1-120/1-121—General Chemistry (10)	Chem 5-610/5-611—Physical Chemistry (7)
Chem 3-210—Introductory Quantitative Analysis (5)	(or) Chem 5-620/5-621/5-622—Physical Chemistry (9)
Chem 3-510/3-511—Organic Chemistry (8)	Total (40)
(or) Chem 3-520/3-521/3-522—Organic Chemistry (15)	

Students taking Chem 1-120/1-121 are required 5 less credits. All students are urged to substitute Chem 3-520/3-521/3-522 for Chem 3-510/3-511 and those who are qualified are urged to substitute the lecture part of Chem 5-620/5-621/5-622 for Chem 5-610/5-611.

REQUIRED SUPPORTING COURSES

In addition to the required courses in chemistry, a major sequence for the B.A. degree shall include: (a) Phys 1-030/1-031, 1-033, 1-037; (b) Math 1-286.

MINOR IN CHEMISTRY FOR THE B.A. DEGREE

Chem 1-110/1-111/1-112—General Chemistry (15)	Chem 3-510/3-511—Organic Chemistry (8)
(or) Chem 1-120/1-121—General Chemistry (10)	Total (28)
Chem 3-210—Introductory Quantitative Analysis (5)	

Students taking Chem 1-120/1-121 are required 5 less credits. At least 5 credits in college mathematics are required.

MAJOR IN CHEMISTRY FOR THE B.S. DEGREE

(including required supporting courses)

First Year

Chem 1-110/1-111/1-112—General Chemistry (15)
(or) Chem 1-120/1-121—General Chemistry (10)
Chem 3-210—Introductory Quantitative Analysis (5)
Math 1-286—Calculus I (4)
Math 1-287—Calculus II (4)
Math 3-288—Calculus III (4)
Phys 1-030—Introduction to Physics (4)
Phys 1-033—Introduction to Physics Laboratory (1)

Second Year

Chem 3-520/3-521/3-522—Organic Chemistry (15)
Math 3-320—Vectors and Matrices (4)
Math 3-501—Fortran Programming (3)
Phys 3-060/3-061—Dynamics, Electricity, and Magnetism (9)
Phys 3-070—Physics Laboratory (1)

Third Year

Chem 3-210—Introductory Quantitative Analysis (5)

Chem 3-180—Undergraduate Seminar (spring qtr) (0)

Chem 5-410/5-411—Inorganic Chemistry (5)

Chem 5-620/5-621/5-622—Physical Chemistry (12)

Fourth Year

Chem 3-180—Undergraduate Seminar (1)

Chem 5-230—Quantitative Analysis (5)

Students taking Chem 1-120/1-121 are required 5 less credits. For graduate school candidates, 15 credits of German are strongly recommended.

Students who wish to be certified to the American Chemical Society as having completed the minimum requirements set for the B.S. degree must elect 10 credits of German and advanced courses providing 75 contact hours of laboratory work of which only 45 may be Senior Honors Research.

MINOR IN CHEMISTRY FOR THE B.S. DEGREE

Chem 1-110/1-111/1-112—General Chemistry (15)

(or) Chem 1-120/1-121—General Chemistry (10)

Chem 3-210—Introductory Quantitative Analysis (5)

Chem 3-520/3-521/3-522—Organic Chemistry (13)

(or) Chem 3-510/3-511—Organic Chemistry (8)

and Chem 5-610—Physical Chemistry (3)

(or) Chem 5-332—Biochemistry (4)

Total (31)

Students taking Chem 1-120/1-121 are required 5 less credits. At least 5 credits in college mathematics are required.

COURSES

1-100. GENERAL CHEMISTRY. (4 cr; prereq high school chemistry or 1-103; 4 hrs lect, 2 hrs lab)

Important principles of inorganic, organic, and biological chemistry adapted to the needs of students of nursing and of dental hygiene.

1-101. ASPECTS OF CHEMISTRY. (5 cr, §1-103, §1-108, §1-110, §1-120; 1-101 will not satisfy requirements for majors or minors in the Division of Science and Mathematics)

A nonmathematical approach to selected topics in general, organic, and biological chemistry. Intended to be a true liberal arts offering and an independent unit in contrast to Chem 1-103, 1-110, or 1-120. Can be used as a minimum survey in chemistry for students requiring an elementary course in physiology.

1-103/1-104. GENERAL CHEMISTRY. (5 cr each, §1-110/1-111; primarily for students who will terminate study of chemistry with no more than 15 cr; 5 hrs lect, rec and lab prep, 2 hrs lab)

General principles; atomic structure, solutions, ionization; properties and uses of metals, nonmetals, acids, bases, and salts.

1-108. CHEMISTRY FOR ELEMENTARY EDUCATION. (4 cr for both lect and lab, §1-103 or §1-110 [1 cr for lab only by §1]; prereq elementary education major; 3 hrs lect, 2 hrs lab)

Subject matter background for effective teaching at the elementary school level.

1-110/1-111/1-112. GENERAL CHEMISTRY. (5 cr each, §1-103/1-104; primarily for students who will take more than 15 cr in chemistry; prereq high school chemistry and satisfactory score on placement exam or Δ , ∇ Math 1-110; 3 hrs lect, 1 hr rec, 4 hrs lab)

Fundamental principles exemplified by study of elements, compounds, and their reactions.

1-120/1-121. GENERAL CHEMISTRY. (5 cr each; 4 hrs lect, 1 hr rec, 3 hrs lab for 1-120...3 hrs lect, 2 hrs rec, 3 hrs lab for 1-121)

An honors course for students selected from those with the highest scores on the Chem 1-110 placement test.

Section 2—Major-Minor Requirements and Courses

- 1-500. ORGANIC CHEMISTRY.** (5 cr, §3-510 or §3-520; prereq 1-104 or 1-111; 4 hrs lect and rec, 4 hrs lab)
Nature and reactions of organic compounds with examples of such compounds occurring in plants, animals, and foods or used for medical and household purposes.
- 3-106. CHEMISTRY IN MODERN LIFE.** (4 cr; primarily for majors in the humanities and social sciences; 3-106 will not satisfy requirements for a major or minor in chemistry)
Consideration of chemistry from the standpoint of its effect and influence on contemporary problems. No science background is assumed.
- 3-180. UNDERGRADUATE SEMINAR.** (1 cr; 1 hr per wk for 4 qtrs)
Practice in the preparation and oral presentation of reports on articles from the literature or on senior research.
- 3-190. SENIOR RESEARCH.** (Cr ar; open only to sr chemistry majors with Δ)
Designed to provide limited experience in a selected area of research in chemistry.
- 3-191. SENIOR HONORS RESEARCH.** (1-3 cr [may be repeated for maximum of 9 cr]; open only to sr chemistry majors admitted to honors program in chemistry or Δ)
- 3-210. INTRODUCTORY QUANTITATIVE ANALYSIS.** (5 cr; prereq 1-112 or 1-121; 3 hrs lect, 6 hrs lab)
Theory and practice in analytical techniques; introduces gravimetric, volumetric, and spectrophotometric methods.
- 3-510/3-511. ORGANIC CHEMISTRY.** (4 cr each, §1-500 or §3-520; prereq 1-112 or 1-121 or #; 3 hrs lect, 3½ hrs lab)
The chemistry of carbon compounds with emphasis on those of biological importance.
- 3-520/3-521/3-522. ORGANIC CHEMISTRY.** (5 cr each [3-522 may be taken for 3 cr by attending lect only], §1-500 or §3-510; prereq 1-112 or 1-121 or #; 3 hrs lect, 6 hrs lab)
Compounds of carbon.
- 5-220. QUANTITATIVE ANALYSIS.** (4 cr; prereq 5-230; 2 hrs lect, 6 hrs lab) Moore
Theory and practice in classical and instrumental methods of chemical analysis, including methods of separation.
- 5-230. QUANTITATIVE ANALYSIS.** (5 cr [3, 4 cr with #]) Bydalek
Theory and practice in classical and instrumental methods of chemical analysis.
- 5-234. METHODS OF SEPARATION.** (4 cr, §5-231; prereq grad standing or #) Bydalek
Theory and applications of various separation techniques including solvent extraction, chromatography, and ion exchange.
- 5-236. ELECTROCHEMICAL METHODS OF ANALYSIS.** (4 cr, §5-235; prereq grad standing or #) Bydalek
Treatment of electrochemical methods including potentiometry, voltametry, and coulometry.
- 5-238. ANALYTICAL TECHNIQUES, LABORATORY.** (1-3 cr [may be repeated for a maximum of 3 cr], §5-237; prereq grad standing or #) Bydalek
Quantitative laboratory work in instrumental and separation techniques.
- 5-332/5-333. BIOCHEMISTRY.** (5 cr each [may be taken for 4 cr each by attending lect only], §5-330/5-331; prereq 3-511 or 3-522 and Math 1-286...physical chemistry recommended; 4 hrs lect, 3 hrs lab)
Significance of the structure and reactivities of biochemically important compounds and their interactions in living systems with emphasis on bioenergetics, enzyme activities, and control of metabolic processes. Laboratory in various biochemical techniques.
- 5-335. BIOCHEMICAL TECHNIQUES.** (1-3 cr [the three areas will be covered separately with 1 cr for each...the student may take any combination of a, b, and c]; prereq 5-331 or #; 3 hrs lab per cr) Salo
Laboratory in biochemical techniques with emphasis on (a) chromatography and electrophoresis, (b) radioisotopes, and (c) enzymes and metabolism.
- 5-399. RESEARCH TOPICS FOR HIGH SCHOOL CHEMISTRY TEACHERS.** (3-6 cr [may be repeated for a maximum of 12 cr]; prereq admission to M.A. program in education and approval of Chemistry Department)
Experimental work and philosophy associated with a selected research topic in chemistry.
- 5-410/5-411. INORGANIC CHEMISTRY.** (3/2 cr; prereq 5-610 or 5-620; 3 hrs lect for 5-410, 2 hrs lect for 5-411) L Thompson

- 5-410: Atomic structure and properties of elements based thereon. Chemical bonding. Chemistry of coordination compounds. 5-411: Mechanisms of selected inorganic reactions; survey of the chemistry of the representative elements.
- 5-413. INORGANIC CHEMISTRY LABORATORY.** (2 cr; prereq 5-410 and 5-411 or #; 5 hrs lab, 1 hr discussion) L Thompson
Preparation of typical inorganic compounds, illustrating special and more advanced techniques.
- 5-430. ADVANCED INORGANIC CHEMISTRY.** (3 cr; prereq 5-410 and 5-411 or #) Magnuson, L Thompson
Descriptive inorganic chemistry of the nontransition elements interpreted in terms of modern theory. Symmetry and chemical applications of group theory.
- 5-440. THEORETICAL INORGANIC CHEMISTRY.** (3 cr; prereq 5-430 or #) Magnuson, L Thompson
Discussion of structure, reactions and bonding in inorganic compounds in terms of valence bond, molecular orbital and ligand field theories. Theory and application of absorption spectroscopy.
- 5-441. PHYSICAL METHODS IN INORGANIC CHEMISTRY.** (3 cr; prereq 5-440) Magnuson, L Thompson
Continuation of Chem 5-440 with emphasis on physical methods as applied to organometallic and transition metal complexes.
- 5-530. STRUCTURAL ORGANIC CHEMISTRY.** (4 cr; prereq 3-522, 5-622, and grad standing or equiv; 3 hrs lect, 3 hrs lab) Caple, Cowles
Applications of absorption spectroscopy in molecular structure determinations.
- 5-531. ORGANIC REACTION MECHANISMS I.** (4 cr; prereq 3-522, 5-622, and grad standing or equiv; 3 hrs lect, 1 hr problem session) Caple
Methods and theory of establishing organic mechanisms, with examples.
- 5-532. ORGANIC SYNTHESIS I.** (4 cr; prereq 3-522 and grad standing or #; 3 hrs lect, 1 hr seminar) R M Carlson
Study of reagents and reactions and their applications in organic synthesis.
- 5-540. ORGANIC REACTION MECHANISMS II.** (3 cr; prereq 5-531 and grad standing or #; 3 hrs lect) Caple
Continuation of Chem 5-531 with emphasis on carbonium ion chemistry and rearrangements.
- 5-541. ORGANIC SYNTHESIS II.** (3 cr; prereq 5-532 and grad standing or #; 1 hr lect, 2 hrs seminar) R M Carlson
Continuation of Chem 5-532 with specific examples from the chemical literature.
- 5-610/5-611. PHYSICAL CHEMISTRY.** (4/3 cr [may be taken for 3/3 cr by omitting lab work]; prereq 3-511 or #, Math 1-286; 3 hrs lect for 5-610, 5-611, 3 hrs lab for 5-610) Harriss, Nichol
Properties of gases, liquids, and solutions; thermodynamics and equilibria; electrochemistry; chemical kinetics.
- 5-620/5-621/5-622. PHYSICAL CHEMISTRY.** (3/4/5 cr [may be taken for 3/3/3 cr by omitting lab work]; prereq 2 yrs chemistry, incl 3-210 or #, Phys 3-061, Math 3-288; 3 hrs lect for 5-620, 5-621, 5-622, 3 hrs lab for 5-621, 6 hrs lab for 5-622) Nichol
Quantitative treatment of physical principles and theories underlying chemistry. Laboratory, physico-chemical measurements.
- 5-632. CLASSICAL, STATISTICAL THERMODYNAMICS.** (4 cr, §5-631; prereq 5-622 and grad standing or #; 4 hrs lect) Harriss, Nichol
Review of classical thermodynamics and introduction to the principles of equilibrium statistical thermodynamics.
- 5-635. INTRODUCTION TO QUANTUM THEORY.** (3 cr; prereq 5-622 and grad standing or #; 3 hrs lect) Harriss
Electronic structure and spectra of atoms, principles of wave mechanics, and theoretical aspects of the chemical bond.
- 5-636. INTRODUCTION TO MOLECULAR STRUCTURE.** (3 cr; prereq 5-635; 3 hrs lect) Harriss
Applications of quantum mechanics to molecular structure, spectra, and spectroscopic methods.
- 5-643. CHEMICAL KINETICS.** (4 cr, §5-641; prereq 5-632 and grad standing or #; 4 hrs lect) Bydalek, Harriss, Nichol
Reaction velocity and mechanisms of reactions in gases and in solution. Absolute reaction rate theory, relationship between kinetics and thermodynamics, catalysis.

Section 2—Major-Minor Requirements and Courses

- 8-180. **SEMINAR.** (1 cr [may be repeated for credit])
Practice in the preparation and oral presentation of reports on articles from the literature or on graduate research.
- 8-199. **RESEARCH IN CHEMISTRY.** (Cr ar)
- 8-250. **SELECTED TOPICS IN ANALYTICAL CHEMISTRY.** (Cr ar; prereq grad standing or #) Bydalek
- 8-260. **GENERAL SURVEY IN ANALYTICAL CHEMISTRY.** (1 cr; by proficiency exam only)
Independent reading which is prerequisite to candidacy for the M.S. degree in analytical chemistry.
- 8-350. **SELECTED TOPICS IN BIOCHEMISTRY.** (Cr ar; prereq #) Salo
- 8-450. **SELECTED TOPICS IN INORGANIC CHEMISTRY.** (Cr ar; prereq #) Magnuson, L Thompson
- 8-460. **GENERAL SURVEY IN INORGANIC CHEMISTRY.** (1 cr; by proficiency exam only)
Independent reading which is prerequisite to candidacy for the M.S. degree in inorganic chemistry.
- 8-550. **SELECTED TOPICS IN ORGANIC CHEMISTRY.** (Cr ar; prereq #) Caple, R M Carlson
- 8-560. **GENERAL SURVEY IN ORGANIC CHEMISTRY.** (1 cr; by proficiency exam only)
Independent reading which is prerequisite to candidacy for the M.S. degree in organic chemistry.
- 8-650. **SELECTED TOPICS IN PHYSICAL CHEMISTRY.** (Cr ar; prereq grad standing or #) Harriss, Nichol
- 8-660. **GENERAL SURVEY IN PHYSICAL CHEMISTRY.** (1 cr; by proficiency exam only)
Independent reading which is prerequisite to candidacy for the M.S. degree in physical chemistry.

Chemistry for High School Teachers

- Sci 5-350/5-351. **CHEMISTRY FOR HIGH SCHOOL TEACHERS III-IV.** (3 cr each; prereq Δ ; 4 hrs lect and quiz, 4 hrs lab; offered summer only)
Complete participation in lecture-quiz of Chem 3-510/3-511 is required. A library research paper and special problems will be assigned. Experiments of particular importance to high school chemistry will be included in the laboratory assignments.

COMMUNICATIONS

(English Department)

Adviser—Assistant Professor Martz

MINOR IN COMMUNICATIONS FOR THE B.A. OR B.S. DEGREE

The minor in communications is designed to provide basic knowledge of the operation and role of the communications media, including some emphasis on techniques. It is not intended to fulfill the requirements of a professional journalist.

Engl 1-112—Advanced Writing (4)
Jour 1-105—Journalistic Writing (4)
Jour 1-110—Visual Communication (3)
Jour 1-202—News Reporting (4)
Jour 3-121—Ethical Problems in Journalism (4)
Jour 3-302—News Editing (4)

Pol 3-310—Public Opinion and Propaganda (4)
Spch 1-101—Rhetoric of Our Times (3)
Spch 1-301—Introduction to Communication Media (3)

Total (33)

OTHER SUGGESTED COURSES

BA 3-743—Advertising Issues (4)
 Ind 1-601—Introduction to Graphic Arts (5)
 Ind 1-611—Printing Layout and Design (4)

Jour 1-120—Mass Communications Law (2)
 Jour 3-202—Interpretive Reporting (4)
 Jour 3-402—History of Journalism (4)
 Spch 1-420—Basic Radio and Television (4)

DRIVER AND SAFETY EDUCATION

(Secondary Education Department)

Adviser—Assistant Professor Starr

MINOR IN DRIVER AND SAFETY EDUCATION FOR TEACHER EDUCATION

Hlth 1-500—First Aid and Safety (1)
 Ind 1-353—Automotive Mechanics (4)
 Ind 3-950—Safety Education (4)
 SeEd 5-281—Driver Education I (4)
 SeEd 5-283—Driver Education II (4)
 SeEd 5-285—Behavioral Factors: Traffic Problem (3)

SeEd 5-287—Physical Factors: Traffic Problem (3)
 SeEd 5-289—Highway Traffic Administration (3)
Total (26)

The minor in driver and safety education is designed to provide the professional preparation for teaching driver and safety education in junior and senior high school.

SUGGESTED SUPPORTING COURSES

BA 1-204—Introduction to Data Processing (3)
 BA 3-734—Transportation Logistics (4)
 (or) Econ 3-042—Economics of Transportation (4)

Econ 1-203—Statistical Methods (4)
 (or) Psy 3-811—Basic Statistical Methods (5)
 Ind 1-310—Small Gasoline Engines (2)

EARTH SCIENCE (ESci)

(Geology Department)

Advisers—Professor Marsden; Assistant Professor Matsch

MAJOR IN EARTH SCIENCE FOR THE B.S. DEGREE

Recommended for students intending to seek teacher certification.

Ast 1-010, 1-020—Descriptive Astronomy (6)
 Geog 3-412—Weather Elements (4)
 Geol 1-110—Introductory Geology (5)
 Geol 3-120—Geology of North America (3)
 Geol 3-131—Oceanography (4)
 Geol 3-200—Geomorphology (4)
 Geol 3-310/3-311/3-312—Earth Materials I-II-III (13)

Geol 5-010—Advanced Earth Science for Teachers (3)
 Geol 5-190—Geologic Problems (2)
Total (44)

SUPPORTING COURSES REQUIRED

Chem 1-103/1-104 or 1-110/1-111
 Geog 1-403
 Math 1-185
 1 year college physics

ECONOMICS (Econ)

Advisers—Professor Meyers; Associate Professor Jesswein; Assistant Professors Holt, Lichty, D. Nelson, J. Peterson; Instructor Raab

MAJOR IN ECONOMICS FOR THE B.A. DEGREE

REQUIRED ECONOMICS COURSES

Lower Division

Econ 1-004—Principles of Economics:
Micro (4)

Econ 1-005—Principles of Economics:
Macro (4)

Econ 1-203—Statistical Methods (4)

Upper Division

Econ 3-059—Seminar (2)

Econ 3-111—Microeconomic Analysis (5)

Econ 3-112—Macroeconomic Analysis (5)

ELECTIVES

Electives in economics courses to include at least two of the following areas (21) (by petition, the student may request an area other than those given below; the area to be completed by one regular course and an independent study totaling 8 credits):

Area 1. Econ 3-652—Government Regulation of Business (4)

Econ 5-622—Industrial Organization (4)

Area 2. Econ 3-704—Money and Banking (4)

Econ 5-752—Monetary Economics (4)

Area 3. Econ 3-361—Regional Economics, Location Theory (5)

Econ 3-362—Urban Economics (4)

Area 4. Econ 3-101—Quantitative Economics I (4)

Econ 5-222—Quantitative Economics II (4)

Area 5. Econ 3-011—History of Economic Thought (4)

Econ 5-052—Issues in Economic Thought (4)

Total (45)

SUPPORTING COURSES REQUIRED

BA 1-504 and Math 1-153, 1-154, 1-155. These supporting courses and required Lower Division courses should be completed by the end of the sophomore year.

MINOR IN ECONOMICS FOR THE B.A. DEGREE

Requires the same Lower and Upper Division courses as the major with the exception of the senior seminar, and only one area of concentration required.

Total (30)

SUPPORTING COURSES REQUIRED

BA 1-504, Math 1-153, 1-154, 1-155. These supporting courses and the required Lower Division economics courses should be completed by the end of the sophomore year.

MAJOR IN ECONOMICS FOR THE B.S. DEGREE

Required for students intending to seek teacher certification.

REQUIRED ECONOMICS COURSES

Lower Division

Econ 1-004—Principles of Economics:
Micro (4)

Econ 1-005—Principles of Economics:
Macro (4)

Econ 1-203—Statistical Methods (4)

Upper Division

Econ 3-111—Microeconomic Analysis (5)

Econ 3-112—Macroeconomic Analysis (5)

Econ 5-003—Consumer Economics (4)

Econ 5-032—Materials, Methods in Economic Education (4)

Electives in Economics (15)

Total (45)

SUPPORTING COURSES REQUIRED

BA 1-504 and Math 1-153, 1-154, 1-155. These supporting courses and the required Lower Division economics courses should be completed by the end of the sophomore year.

MINOR IN ECONOMICS FOR THE B.S. DEGREE

Required for students intending to seek teacher certification.

REQUIRED ECONOMICS COURSES

Lower Division

- Econ 1-004—Principles of Economics:
Micro (4)
Econ 1-005—Principles of Economics:
Macro (4)
Econ 1-203—Statistical Methods (4)

Upper Division

- Econ 3-111—Microeconomic Analysis (5)
Econ 3-112—Macroeconomic Analysis (5)
Econ 5-003—Consumer Economics (4)
Econ 5-032—Materials, Methods in Economic Education (4)

Total (30)

SUPPORTING COURSES REQUIRED

BA 1-504 and Math 1-153, 1-154 and 1-155. These supporting courses and the required Lower Division economics courses should be completed by the end of the sophomore year.

COURSES

- 1-002. INTRODUCTION TO ECONOMICS.** (4 cr [cr not allowed toward economics major or minor], §1-001; designed specifically for Liberal Education purposes)
General description of the economy of the United States and an analysis of contemporary economic problems. Will introduce the student to the major economic issues and problems of the day and provide a simple framework, used by the economist, for analysis of these issues and problems.
- 1-004. PRINCIPLES OF ECONOMICS: MICRO.** (4 cr, §1-007)
Demand and supply, utility, production and cost, output market analysis, input market analysis, applications of microeconomics. Of value to the general education student and required for majors in economics, business administration, accounting, and for economics minors.
- 1-005. PRINCIPLES OF ECONOMICS: MACRO.** (4 cr, §1-008)
National income accounting, national income theory, public finance, money, monetary policy, international trade, economic growth. Of value to the general education student and required for majors in economics, business administration, accounting, and for economics minors.
- 1-203. STATISTICAL METHODS.** (4 cr, §1-202; prereq 1-004 and 1-005)
Descriptive statistics for samples, probability, random variables and their distributions, sampling, estimation, hypothesis testing, regression and correlation.
- 1-204. QUANTITATIVE RESEARCH METHODS.** (4 cr; prereq 1-203)
An introduction to empirical social-scientific research, including design and plan of research as well as quantitative techniques.
- 3-005. AMERICAN ECONOMIC HISTORY.** (4 cr, §3-004; prereq 1-004 and 1-005)
The economic development of the United States in the 19th century, focusing on an understanding of the historical growth process.
- 3-011. HISTORY OF ECONOMIC THOUGHT.** (4 cr, §3-021, §5-021; prereq 1-004 and 1-005)
A survey of the major authors and schools of economics.
- 3-042. ECONOMICS OF TRANSPORTATION.** (4 cr; prereq 1-004 and 1-005; offered alt yrs)
Organization and economic aspects of the transportation system of the United States. The theory and practice of transportation rate determination. Transportation regulation and national policy. The urban transportation problem.
- 3-059. SEMINAR.** (2 cr; prereq B.A. major in economics, sr standing or Δ)
Studies and reports on recent developments in theoretical and applied economics.
- 3-101. QUANTITATIVE ECONOMICS I.** (4 cr, §3-154 or §3-151; prereq 1-004, 1-005, 1-203 and Math 1-154)
An introduction to the use of elementary mathematical and statistical techniques in economic analysis.
- 3-111. MICROECONOMIC ANALYSIS.** (5 cr; prereq 1-004 and Math 1-154)
Behavior of households as consuming units and suppliers of resources; analysis of decision making by firms under various market conditions; introduction to welfare theory and applications of welfare theory to various market phenomena and government policies.

Section 2—Major-Minor Requirements and Courses

- 3-112. MACROECONOMIC ANALYSIS.** (5 cr; prereq 1-004, 1-005, and Math 1-154)
Determinants of national income, employment, and price levels, with particular attention to aggregate consumption and investment, and monetary and fiscal policy.
- 3-346. PRINCIPLES OF URBAN ECONOMICS.** (4 cr; prereq 1-004; 3-346 may not be substituted for 3-362 as a part of the Regional Urban Area for majors in economics)
The analysis of the growth of urban centers in a developed economy and the particular problems associated with this growth. Emphasis will be placed on the economic structure of cities so that alternative policy measures may be evaluated.
- 3-361. REGIONAL ECONOMICS, LOCATION THEORY.** (5 cr; prereq 3-111)
An examination of the allocation of unevenly distributed and imperfectly mobile resources. Economic models will be developed based on critical variables such as population growth, technological innovation, and changes in regional income. Prediction of the future distribution of economic activity will be based primarily on changes in these variables.
- 3-362. URBAN ECONOMICS.** (4 cr; prereq 3-361)
Alternate theories relating to urban growth processes will be presented and compared. Intraurban structural development models will be evaluated. Selected economic problems unique to the urban setting will be analyzed. Governmental policies with respect to the urban community will be investigated.
- 3-652. GOVERNMENT REGULATION OF BUSINESS.** (4 cr, §3-651; prereq 3-111)
An examination of the alternatives open to a free enterprise economy when economic goals have not been satisfactorily achieved by the private sector. Public regulation and ownership as well as antitrust legislation are possible ways of modifying socially unacceptable economic results.
- 3-704. MONEY AND BANKING.** (4 cr, §3-701; prereq 1-005)
The money and banking system—its historical pattern and present operation. The role of financial institutions with emphasis on the Federal Reserve System. Control of the commercial banking system. Monetary theory and policy and international finance.
- 3-803. PUBLIC FINANCE.** (5 cr, §3-801, §3-802; prereq 1-004 and 1-005)
Governmental expenditure patterns and revenue related to the economic system, including considerations of public goods, welfare economics, social costs, and determination of public expenditures programs in a democratic society. Distribution of tax burden, types of taxation: income, consumption, property, sales, estate, and gift. Debt policy and economic stabilization.
- 3-970. INDEPENDENT STUDY.** (1-6 cr [may be repeated for a maximum of 6 cr]; prereq Δ)
For students wishing to do special work in areas useful to individual programs and objectives not available in regular course offerings.
- 5-003. CONSUMER ECONOMICS.** (4 cr [cr not allowed for major or minor in economics for B.A. degree], §5-001; prereq 1-005 or §)
Application of economic principles to major decisions of consumers. Concept of alternative choice. Opportunity cost. How to use income most effectively; use of credit; saving; insurance principles; analysis of advertising as it affects the consumer; sources of consumer information; product testing agencies; analysis of contracts common to consumers; government efforts to protect consumers.
- 5-020. CURRENT ECONOMIC ISSUES.** (1 to 6 cr [may be repeated for a maximum of 6 cr]; prereq 1-004 and 1-005 or §)
Current controversies over economic policy and the problems that underlie them. Special study of selected topics.
- 5-032. MATERIALS, METHODS IN ECONOMIC EDUCATION.** (4 cr, §SeEd 5-266; prereq §)
Analysis, evaluation, and sources of materials; planning and development of materials and methods for elementary and secondary classrooms.
- 5-052. ISSUES IN ECONOMIC THOUGHT.** (4 cr, §5-021, §5-022, §5-023; prereq 3-011)
Study of the development of selected economic theories.
- 5-222. QUANTITATIVE ECONOMICS II.** (4 cr, §5-255 or §3-251; prereq 3-101)
The use of mathematical and statistical techniques in economic analysis.
- 5-352. ECONOMIC DEVELOPMENT.** (4 cr; prereq 3-111 or §)
Economic analysis of the various factors leading to the economic development of nations. Consideration of the specific problems faced by underdeveloped nations and their approaches to problem solving. Study of alternate measurements of economic development.

- 5-453. INTERNATIONAL ECONOMICS AND FINANCE.** (5 cr; prereq 3-111 and 3-112 or 2)
Classical and modern theory of international trade. Extension, empirical verification, and applications of modern theory. Alternative theories of international trade. Concept and measurement of balance of payments. Methods of balance of payments adjustments. Alternative international monetary systems. Selected current issues.
- 5-622. INDUSTRIAL ORGANIZATION.** (4 cr; prereq 3-652)
An examination of the theory of industrial organization, its verification from empirical studies, and policy implications.
- 5-752. MONETARY ECONOMICS.** (4 cr, §5-721; prereq 3-112 and 3-704)
Problems in monetary theory; Federal Reserve control of financial institutions; money market strategy and principal problems in monetary policy including goals, targets, and indicators.
- 5-821. PUBLIC FINANCE.** (3 cr; prereq 3-111, 3-112, 3-803)
Government expenditures, budgeting, fiscal policy, debts, and taxes; special emphasis on economic effects including tax incidence, tax principles, practices, and policies.

EDUCATION

See Section 4 for master of arts degree programs in education, educational administration, educational psychology, and for the specialist certificate in educational administration.

Preparation for Teaching

A good teacher is expected to have a broad liberal education, intensive training in his field of specialization, and professional teaching competence. The liberal education requirements for a good teacher are essentially the same as for any other UMD student.

A wide variety of major and minor sequences offers broad opportunity for specialization. It is particularly important that the student choose an appropriate combination of major and minor fields; the Placement Office can furnish up-to-date information on the combinations of subjects requested by superintendents in hiring teachers for their schools.

Professional teaching competence is a complex achievement attained over a period of many years. It involves physical, intellectual, and emotional qualities. The Division of Education and Psychology seeks to contribute to the growth of such competence by offering professional education courses in the junior and senior years.

Prior to admission to teacher education the student must attend one or more noncredit orientation sessions, which will provide information about the teaching profession and the requirements in teacher education at UMD. These sessions will also afford an opportunity for questions relative to teaching as an appropriate choice of career.

Freshman and sophomore students who are undecided about possible teacher education goals, or who desire counsel relative to their eligibility for later acceptance in a program, are encouraged to make an appointment for an interview by reporting to the office of the Department of Elementary Education or the Department of Secondary Education. (See also Requirements for Teacher Certification, pages 47-48.)

Special Advisement

Prospective teacher education students of the following types will need special advisement: those holding a degree from UMD without teacher

Section 2—Major-Minor Requirements and Courses

certification, those with a degree from another institution, experienced teachers without a degree, those wishing to renew a lapsed certificate. Advice may be obtained from the head of either the Department of Elementary Education or the Department of Secondary Education, whichever is appropriate.

Specialization in Reading

Elementary and secondary teachers may seek certificate endorsement as (a) an elementary remedial reading teacher, (b) a secondary reading teacher, developmental or remedial, and (c) a reading consultant. Consult certification regulations for specific requirements. The basic preparation should be taken in the following sequence:

PREREQUISITE PHASE

EIEd 3-377—Teaching Reading—

Elementary

EIEd 5-379—Materials in Reading—

Elementary

SeEd 5-215—Reading in Secondary Schools

(Elementary teachers need to take EIEd 3-377 or EIEd 5-379; secondary teachers need to take (a) EIEd 3-377 or EIEd 5-379 and (b) SeEd 5-215)

SPECIALIZATION PHASE

Educ 5-370—Reading Disabilities

Educ 5-672—Practicum: Reading Diagnosis

Educ 5-673—Practicum: Reading Remediation

EIEd 5-378—Trends in Reading—Elementary

SpEd 5-371—Clinical Procedures with Children

Elementary Education (EIEd)

Advisers—Professor H. Johnson; Associate Professors Gemeinhardt, Lidberg; Assistant Professors Bryant, Erickson, Fadum, Jurkovich, Norha, Swanson, Sword, Wolean

PROGRAMS FOR TEACHER EDUCATION— ELEMENTARY AND KINDERGARTEN-PRIMARY

The Department of Elementary Education has two programs leading to the bachelor of science degree, one in elementary education, and the other in kindergarten-primary. The former qualifies a person for teaching in grades 1 through 6 in any elementary school in Minnesota. The latter qualifies a person to teach in the kindergarten, in addition to the other grades of the elementary school.

Freshman and sophomore students who are undecided about possible elementary teacher education goals, or who desire counsel relative to their eligibility for later acceptance in the program, are encouraged to make an appointment for an interview by reporting to the office of the Department of Elementary Education. Such students are encouraged to enroll in the elective course EIEd 1-120, Elementary Education as a Career, and also, if necessary, EIEd 1-121.

Supporting Course Requirements (for both Elementary and Kindergarten-Primary)—The following, selected largely from liberal education courses, are used to satisfy liberal education requirements toward the bachelor of science degree. They also provide a minimum background of knowledge in the various disciplines relating to the elementary school curriculum. It is assumed that for the typical elementary major, these courses will be completed during the freshman and sophomore years of college.

Art 1-002—Introduction to Art (4)
 Art 3-810—Art in Elementary Education (5)
 **Biol 1-003—Biology for Elementary Education (4)
 **Chem 1-108—Chemistry for Elementary Education (4 or 1)
 Engl 1-106/1-107—Freshman Composition (8)
 English electives—two courses from among those listed under liberal education requirements (category 4, page 43) including also Hum 1-021, 1-022, 1-023
 **Geol 1-110—Introductory Geology (5)
 Hlth 1-101—Personal Health (2)
 Math 1-080—Mathematics I, Elementary Education (4)

Math 1-081—Mathematics II, Elementary Education (4)
 Mu 1-001—Introduction to Music (3)
 ***Mu 1-611—Music Fundamentals (2)
 PE 3-326—Pre-Adolescent Considerations (4)
 **Phys 1-020—Physics for Elementary Education (4)
 Social sciences—18 credits from at least 3 of the following fields: economics, geography, history, political science, sociology-anthropology
 Spch 1-101—Rhetoric of Our Times (3)
 Spch 1-111—Beginning Public Speaking (3)

Additional credits, to satisfy degree requirements, beyond those listed above, must include a minimum of 18 credits in other than education courses numbered 3-000 or above. Although a minor is not required, a student may choose one if he desires. It should be pointed out that since a number of elementary schools now are departmentalized or are involved in team teaching, academic strength in a teaching field, as evidenced by a minor, would be looked upon favorably by employing officials.

Admission to Professional Sequence—Although students are assigned to advisers in the Department of Elementary Education upon entering the University, they are not formally accepted as candidates for the professional sequence until the end of the sophomore year. Each year the number of students who will be admitted into the professional sequence will be established. This quota will be determined by the resources available to the Department of Elementary Education and the projected demand for teachers. The quota will be filled by students whose records indicate greatest potential for teaching. Among the criteria to be used for selection will be the student's grade point average, results of an achievement test, experiences with children, and in some cases, a personal interview. The student must have a 2.00 overall GPA to be admitted. The achievement test will be administered during the spring quarter to all students applying for admission to the professional sequence in the following summer or fall quarter. Notification of acceptance will be made by the end of the spring quarter, or early in the summer. These conditions apply to all transfer students as well as to University of Minnesota sophomores and others requesting acceptance.

Early in the professional sequence, all students must be tested by a member of the Department of Speech Pathology and Audiology to identify speech problems. Unless already started, each student with correctable deficiencies must begin a program which the Department of Speech Pathology and Audiology deems appropriate in his particular case.

There is continuous evaluation of the progress each student is making toward completion of his academic program and certification.

Major Requirements (Professional Sequence)—Students are asked to refer to a special advisement form, available in the departmental office, for the appropriate sequence of courses, and for other pertinent information

** Student may choose any three of these four courses.

*** Students desiring exemption from Mu 1-611 may do so by passing a competency test. Announcements concerning the taking of the examination will be posted by the Department of Elementary Education.

Section 2—Major-Minor Requirements and Courses

relative to their progress in the major, as well as in other degree requirements. It should be pointed out that courses in the major sequences are not open to students who have not been accepted for admission, except by special departmental approval.

ELEMENTARY EDUCATION MAJOR REQUIREMENTS FOR THE B.S. DEGREE

ELED 3-101—Human Development and Learning (5)	ELED 3-401—Curricular Considerations and Media (5)
ELED 3-105/3-106/3-107—Simulation in Education (3)	ELED 3-509—Professional Quarter (15)
ELED 3-201—Teaching Communications (10)	Mu 3-621—Elementary School Music Teaching (3)
ELED 3-301—Tchg Math, Science and Social Studies (10)	Total (51)

KINDERGARTEN-PRIMARY MAJOR REQUIREMENTS FOR THE B.S. DEGREE

ELED 3-101—Human Development and Learning (5)	ELED 3-395—The Kindergarten (4)
ELED 3-105/3-106/3-107—Simulation in Education (3)	ELED 3-401—Curricular Considerations and Media (5)
ELED 3-201—Teaching Communications (10)	ELED 3-504—Professional Quarter (15)
ELED 3-301—Tchg Math, Science and Social Studies (10)	Mu 3-621—Elementary School Music Teaching (3)
	Total (55)

Students in the kindergarten-primary program are required to demonstrate reasonable competence on an instrument appropriate for accompanying children's singing and rhythmic activities. A departmental statement certifying to this competence must be on file prior to registration for the course ELED 3-504, Professional Quarter.

IMPACT Program—For a number of years, the Elementary Education Department has been carrying on a junior year experimental program known as IMPACT (Integrating Methodology and Professional Activities in Classroom Teaching). This program, involving a modified team-teaching approach, in a block of time, has incorporated most of the courses required in the major sequence. One of its unique characteristics has been the provision of more extensive amounts of observation and participation than is possible in the regularly offered courses. Students interested in this specially designed program should contact the office of the Department of Elementary Education during the early part of their sophomore year.

Application for Professional Quarter (Student Teaching)—Application for the professional quarter must be made during the spring quarter preceding registration for the course. These applications can be obtained in the office of the coordinator of field experiences. It is the student's responsibility to make sure that all prerequisites will have been met before his professional quarter assignment has begun.

Assignment to schools during the professional quarter will be made by the coordinator of field experiences in consultation with administrators of Duluth or area schools. It may be necessary for students to establish residence in communities where they have been assigned.

To insure adequate supervision, the number of students who will be accepted into the professional quarter during the fall, winter, and spring

quarters will be determined. It may be necessary, therefore, for some students to accept a second choice of quarter in which to complete the professional quarter.

Secondary Education (SeEd)

Advisers—Professors Crawford, Plumb, Verrill; Associate Professors Boman, Hendrickson, Loy, Milbrath, Ollenburger; Assistant Professors Bukvich, McKee, Ojala, Starr, Vander Horck

The following requirements give the student a professional preparation for teaching in junior and senior high schools. To obtain a teaching certificate the student must fulfill all the requirements for a Bachelor's degree.

In addition to the education courses the student must complete a pattern of specified departmental academic programs that are recommended for teacher certification. Also, Minnesota state law requires that the program for students seeking teaching certification include courses in physical and health education. It is recommended that all secondary education majors include Hlth 1-101 and one or more physical education courses within their Lower Division program to meet this requirement.

Students may obtain additional information concerning program requirements in 209 Education Building.

SeEd 1-201—Teacher Education, Phase I (Orientation and Admission) (2)

SeEd 3-101—Teacher Education, Phase II (Clinical Experience) (7)

SeEd 3-201—Teacher Education, Phase III (Laboratory Experience) (7)

SeEd 3-301—Teacher Education, Phase IV (Practicum) (10)

SeEd 3-401—Teacher Education, Phase V (Closure Experience) (4)

Total in Education (30)

A new program in professional education for secondary teachers is being initiated in the fall of 1972. Students who have completed part of the "old" program should contact the department head or program director for assistance in planning the remainder of their program.

The new program is divided into five phases. Phase I (2 credits) is an orientation and admission phase. It may be taken as a sophomore at UMD or may be transferred to UMD as an approved equivalent course from a junior college.

After completing Phase I the student may apply for admission to the program. The student must have a 2.00 overall GPA and a 2.00 GPA in the area of his major to be admitted. Also, maintenance of the 2.00 GPA is mandatory for continuation in the program. Testing, interview, and advisement are a part of the admission procedure.

The secondary department will accept no more than 100 participants in Phase II for any given quarter. The participants will be placed on an admission list once their eligibility has been determined. If an eligible candidate is not admitted for 1 quarter because of number limitation, his application and priority on our list would be retained for the following quarter.

All students requesting admission to Phase II must be tested by a member of the Department of Speech Pathology and Audiology to identify speech problems. Each student with correctable deficiencies must have started a program which the Department of Speech Pathology and Audiology deems appropriate in his particular case. Each quarter, specified times will be posted and announced in the *Statesman* when appointments may be made with the Department of Speech Pathology and Audiology.

All interested students should come to 209 Education Building for printed materials which will explain the program. After studying these materials, if questions arise, the student should make an appointment with the program director or department head.

Special Education (SpEd)

Advisers—Professor Simula; Associate Professor Lilly; Assistant Professor Schauland

Programs are specifically intended for persons who wish to become qualified to work in the special education service areas of mental retardation and learning disabilities as special class teachers, special resource teachers, teacher consultants, special tutors, district-level supervisors, or learning specialists. Persons completing a program will possess an array of instructional competencies which will permit them to meet the learning needs of children requiring a variety of special educational services.

Requirements for certification through the UMD programs will not be considered complete until a satisfactory level of performance in designated competencies has been attained. This means that the accumulation of the required number of credits in course work will not automatically qualify a person for EMR (educable mentally retarded) or SLBP (special learning and behavior problems) certification.

Students (undergraduate, special, or graduate) need to make application for admission to the program. For admission requirements and procedures, please consult with a program adviser.

MINOR IN SPECIAL EDUCATION FOR THE B.S. DEGREE

The successful completion of the following program qualifies one for certification to teach in special education programs at the elementary and junior high school levels in the state of Minnesota. This minor field must be taken in conjunction with a major in elementary education or kindergarten-primary area of concentration.

EIEd 3-530—Teaching Handicapped
Children (6)

SpEd 5-300—Special Education Seminar
(5)

SpEd 5-301—Exceptionality and Curriculum (3)

SpEd 5-302—Analysis of Instruction (3)

SpEd 5-303—Diagnostic Instruction (3)

SpEd 5-600—Special Area Practicum (5)
Total (25)

SUPPORTING COURSES REQUIRED

SPA 5-110—Normal Language
Development

SPA 5-210—Language Disorders in
Children

SPECIALIZATION IN LEARNING DISABILITIES

Elementary and secondary teachers wishing to specialize in learning disabilities will need to complete approximately 33 quarter hours of specified course work. This program may be taken at either the special or graduate levels. Prospective candidates should consult with program adviser to make formal application for admission to the program and a program of studies prior to enrollment in course work.

COURSES

Education (Educ)

- 3-201. EFFECTS OF NARCOTICS AND ALCOHOL.** (1 cr; prereq Hlth 1-101 or #; required of all candidates for Minnesota teaching certification; auto-tutorial instruction time ar)
A study of the psychological and physiological effects of various drugs upon the human system and the impact of drug use upon various subgroups within our society.
- 3-203. DRUG USE INFORMATION AND EDUCATION.** (1 cr; prereq 3-201 or #; required of all candidates for Minnesota teaching certification; small group seminars 2 hrs per wk)
An investigation of the means, reasons, and pressures for drug use within the various subgroups within our society with a concentration on adolescent use of drugs and an appraisal of current drug education programs.
- 3-810, 3-811. INDEPENDENT STUDY.** (1-3 cr each; prereq #)
- 5-169. LEARNING DIFFICULTIES.** (3 cr; prereq tchg exper or #)
Evaluation of results of teaching, diagnosis of pupil learning difficulty; development and prevention; tests as aids to teaching; following up a testing program.
- 5-200. EXPERIMENTAL STUDY OF CHILDREN.** (3 cr; prereq sr or tchg exper or #)
Experience with various techniques of observing behavior, record keeping, and methods of analyzing and interpreting behavior records; lectures, discussions, and laboratory exercises.
- 5-201. PIAGET FOR TEACHERS.** (3 cr; prereq tchg exper or #)
Piaget's theory of intellectual development; experience with developing, administering, and interpreting conservation and other performance tasks; application of the theory to teaching in areas such as mathematics and science.
- 5-223. SUPERVISION OF STUDENT TEACHING.** (3 cr; prereq 15 cr in education and #)
For persons planning to supervise or administer student teaching and other professional laboratory experiences in elementary and secondary education.
- 5-231. PROGRAMMED INSTRUCTION IN THE CLASSROOM.** (3 cr; prereq tchg exper and #; offered summer only)
Introduction to the principles and techniques of programmed instruction; survey of available programs and devices; problems in development and use of programs in elementary and secondary school classrooms.
- 5-285. THE COMMUNITY SCHOOL.** (3-6 cr; prereq #)
For experienced elementary and secondary school teachers and administrators, and other professional leaders in education from rural village communities. Role of the school as a learning situation for students and as an agency responsible for the continuous growth of adults; analysis of a wide range of community school situations; relationships with other agencies. Description of a particular community school and the solving of a problem within its framework is a part of the responsibility of each class member.
- 5-290. PERSONALIZED TEACHING: INTRODUCTION.** (3 cr; prereq tchg exper or #)
A survey course primarily for in-service teachers with emphasis on more flexible classroom organization, scheduling, and grouping for instruction, on affective education, and on greater student involvement in learning experiences.
- 5-305. MEASUREMENT IN THE CLASSROOM.** (3 cr; prereq Psy 3-811 or #)
Principles of measurement applied to the construction and evaluation of tests and to the interpretation of scores; illustrations from achievement, intelligence, interest, attitude, and personality tests. Each student constructs an examination in the field of his major interest.
- 5-370. READING DISABILITIES.** (3 cr; prereq EIEd 3-377, EIEd 5-379, or basic training in counseling or school psychology, tchg exper, and #)
Causes, prevention, and correction; remedial practices in reading useful to the classroom teacher, school counselor, and reading specialists.
- 5-376. THE CULTURALLY DIFFERENT PUPIL.** (3 cr, §5-375; prereq 9 cr in education)
Educational needs of pupils with cultural backgrounds different from those of the majority of pupils; study of educational programs designed to meet such needs.

Section 2—Major-Minor Requirements and Courses

- 5-379. HUMANIZING EDUCATION.** (3 cr; prereq 10 cr in education)
Provides theory and practice opportunities for developing more human-centered approaches to learning. Emphasis on the affective domain.
- 5-386. DEVELOPING COMMUNITY LEADERSHIP.** (3 cr; prereq 10 cr in education)
Appraisal of community educational agencies; process of and responsibilities for community leadership; role of the school in the rural community; coordination of the school with nonschool educational agencies.
- 5-391. DATA PROCESSING.** (3 cr, §BA 1-204; prereq #)
History, basic philosophy; types of operations performed and machines used in these operations; actual writing of several standard data processing computer programs.
- 5-392. APPLIED DATA PROCESSING.** (3 cr; prereq 5-391 or #)
Systems analysis, systems design, coding, programming, field testing, and implementation of student-selected projects.
- 5-400. WORKSHOP: (Various Titles To Be Assigned).** (1-6 cr each offering [no more than a total of 6 cr can be applied to a Master's degree program]; prereq tchg exper and #)
Opportunities for experienced teachers to concentrate study on common curricular and instructional problems.
- 5-651. DRUG ABUSE INFORMATION.** (3 cr, §3-201, §3-203, §5-400 [Workshop: Drug Education]; prereq tchg exper or working exper in a human services occupation or #)
A multimedia instructional program designed to provide persons who work with young people the basic information about the psychological and physiological effects of common drugs of abuse. The program also probes into the reasons for drug use and abuse in our society and provides an opportunity for the participants to begin the design of a drug abuse prevention program appropriate for their situation.
- 5-672. PRACTICUM: READING DIAGNOSIS.** (3 cr; prereq 5-370, SpEd 5-371, tchg exper, and #)
The relationship of reading difficulties to psychological factors, and their clinical remedial correction.
- 5-673. PRACTICUM: READING REMEDIATION.** (3-6 cr; prereq 5-370, SpEd 5-371, tchg exper, and #)
Remedial tutoring of individual children who have experienced difficulty in school learning.
- 5-750. SPEECH IMPROVEMENT IN THE CLASSROOM.** (4 cr, §5-700; not open to speech pathology majors)
Recognition and management of speech and hearing problems by the elementary and secondary classroom teacher; voice and articulation models; theory and practice of speech improvement in the classroom.
- 5-801. PROGRAMS AND PROCEDURES OF CURRICULUM DEVELOPMENT.** (3 cr; prereq SeEd 5-233 or Eled 5-401 and/or #)
Leadership in procedures, operational processes; major consideration in planning and organizing, interpersonal relationship, and evaluation of improvement programs.
- 5-821. LOGIC FOR TEACHERS.** (3 cr; prereq 9 cr in education)
A study of ways to clarify meaning, to give better structure to a body of knowledge, and to encourage critical thinking. Case studies in elementary and secondary education.
- 5-841. HISTORY OF AMERICAN EDUCATION.** (3 cr; prereq 9 cr in education or #)
Selected readings in American intellectual, political, economic, and social development; special reference to an emerging system of public education.
- 5-891. CRUCIAL ISSUES IN EDUCATION.** (3 cr; prereq 9 cr in education)
A study of several controversial issues in contemporary American education.
- 5-921. AUDIO-VISUAL MATERIALS.** (3 cr; prereq 9 cr in education or #)
Characteristics, advantages, limitations, and practical use of audio-visual materials of nonprojected and projected types; practice in the operation of audio-visual equipment.
- 5-922. AUDIO-VISUAL MATERIALS LABORATORY.** (3 cr; prereq 5-921 or #)
Practice in planning and making materials for audio-visual education and in the use of machines and equipment.
- 8-950.° PROBLEMS IN CURRICULUM CONSTRUCTION.** (3-9 cr per qtr; prereq admission to candidacy for Master's degree and #)
Opportunity for students to work individually on specific problems in elementary or secondary education.

Educational Administration (EdAd)

- 5-115. ELEMENTARY SCHOOL ADMINISTRATION.** (3 cr; prereq #; offered 1972-73 and alt yrs)
 Leadership in the elementary school; organizational plans; grouping; pupil progress policies and reports; parent-teacher organizations; improvement of educational program; special services and other areas of immediate concern to principals.
- 5-116. THE TEACHER AND ADMINISTRATION.** (3 cr; prereq tchg exper, or #; offered 1972-73 and alt yrs)
 Functions of the teacher in school organization; administrative and supervisory relationships; budgetary practices; personnel practices and teacher welfare; home-room and cocurricular responsibilities; records and reports; public relations; teacher organizations and professional conduct; securing advancement in the profession.
- 5-117. SCHOOLS IN RURAL AREAS.** (3 cr; prereq #; offered when feasible)
 Administrative and curricular problems peculiar to rural areas; sociological changes in small towns and farm life; building a school program suited to the culture and needs of people in smaller towns and villages.
- 5-123. ADMINISTERING COMMUNITY EDUCATION.** (3 cr; prereq 5-117 or #; offered 1972-73 and alt yrs)
 Application of fundamental concepts of public school administration to small school systems; particular reference to rural community programs.
- 5-128. WORKSHOP: EDUCATIONAL ADMINISTRATION.** (1-6 cr; prereq practicing educational administrator or #; offered when feasible)
 Laboratory approach provides opportunities for experienced educators to concentrate their study on common administrative and supervisory problems.
- 5-169. MIDDLE SCHOOL ADMINISTRATION.** (3 cr, §5-167; prereq 9 cr in education; offered 1972-73 and alt yrs)
 Sources of the Middle School movement; purposes, functions, and limitations; types of organization; administrative problems of curriculum reorganization.
- 8-201, 8-202. FOUNDATIONS IN ADMINISTRATION.** (3 cr each)
 For all students preparing for public school administrative positions. Aspects of administration as they relate to coordination, operation, and organization of elementary and secondary schools in a local district.
- 8-210. PUBLIC SCHOOL FINANCE.** (3 cr; offered 1973-74 and alt yrs)
 Current practices; sources of revenue; types of taxes; theory of taxation; formulas used for distribution of school aids; and federal, state, and local support of education.
- 8-217. SEMINAR: ELEMENTARY SCHOOL ADMINISTRATION.** (3 cr; prereq 5-115 or #)
 Problems of administration and organization for instruction in elementary schools, communications and social-system theory, organizational analysis, and change strategies.
- 8-218. SEMINAR: SECONDARY SCHOOL ADMINISTRATION.** (3 cr; prereq 8-201, 8-202 and 8-264 or #)
 Problems of administration and organization for instruction in secondary schools, communication and social-system theory, organizational analysis, and change strategies.
- 8-224. SCHOOL LAW.** (3 cr; offered 1972-73 and alt yrs)
 Constitutional, statutory, and common law bases of school administration; principles growing out of fundamental legal procedures.
- 8-226. SCHOOL PLANT PLANNING.** (3 cr; offered 1972-73 and alt yrs)
 Planning educational facilities for public and private school systems; emphasis on writing educational specifications.
- 8-227. TEACHER AND EMPLOYEE ADMINISTRATION.** (3 cr; prereq 8-201, 8-202; offered 1973-74 and alt yrs)
 Selection and placement of school employees, salary schedules, conditions of service, records and reports, and legal aspects.
- 8-235. SEMINAR: EDUCATIONAL ADMINISTRATION.** (3 cr; prereq #)
 Selected topics in school administration, application of theoretical models to problems of decision making, interpersonal relations, and goal attainment. Emphasis on case method and simulation, student analysis of processes, and use of research and writing.

Section 2—Major-Minor Requirements and Courses

- 8-236. FIELD STUDY: EDUCATIONAL ADMINISTRATION.** (0-6 cr; prereq #)
Required for specialist certificate. The 6 credits will be based on a written report covering an approved field study. Students may register for general planning and organization of their study without credit.
- 8-241. INTERNSHIP IN EDUCATIONAL ADMINISTRATION.** (1-3 cr per qtr [may be repeated for a maximum of 3 cr])
For interns in elementary, secondary, and general administration preparing for specialist certificate.
- 8-264. THE SECONDARY SCHOOL PRINCIPALSHIP.** (3 cr; prereq 8-201, 8-202; offered 1973-74 and alt yrs)
Factors affecting administration, staff, and student relationships, intraschool relationships, school services.
- 8-265. SECONDARY SCHOOL ADMINISTRATION.** (3 cr; offered 1973-74 and alt yrs)
Scheduling, administrative practices affecting learning, the academic program, community relationships, program evaluation.
- 8-270.* PROBLEMS: ELEMENTARY ADMINISTRATION.** (3-6 cr per qtr [may be repeated for a maximum of 9 cr]; prereq #)
Independent study.
- 8-271.* PROBLEMS: SECONDARY ADMINISTRATION.** (3-6 cr per qtr [may be repeated for a maximum of 9 cr]; prereq #)
Independent study.

Elementary Education (E1Ed)

- 1-120, 1-121. ELEMENTARY EDUCATION AS A CAREER.** (1 cr each; prereq #; 1 hr lect, 2 hrs participation in schools)
Lectures, observation, and participation directed toward an understanding of career opportunities in the modern elementary school focusing particularly on the role of the elementary school teacher.
- 3-101. HUMAN DEVELOPMENT AND LEARNING.** (5 cr; prereq admission to elementary teacher education or #; 3 hrs lect, 4 hrs lab)
Human growth and development; learning; tests and testing programs; behavioral objectives; statistics.
- 3-105/3-106/3-107. SIMULATION IN EDUCATION.** (1 cr each; prereq admission to elementary teacher education and #; 2 hrs lab)
Video-tape micro-teaching emphasizing the component skills of teaching; mini-teaching: simulated classroom experiences; lesson plans; writing and evaluating behavioral objectives; handwriting and board writing skills.
- 3-201. TEACHING COMMUNICATIONS.** (10 cr; prereq admission to elementary teacher education and 3-101; 8 hrs lect, 4 hrs lab in area school)
Methods, curriculum and materials of instruction in reading, language arts and children's literature.
- 3-301. TCHG MATH, SCIENCE AND SOCIAL STUDIES.** (10 cr; prereq admission to elementary teacher education and 3-101; 8 hrs lect, 4 hrs lab in area schools)
Curriculum, methods and materials of instruction in elementary mathematics, science and social studies.
- 3-311. TEACHING LANGUAGE ARTS—ELEMENTARY.** (3 cr; 3 hrs lect)
Methods, materials, and research findings related to the teaching of oral and written language, spelling, handwriting, and listening at all levels of the elementary school.
- 3-320. STORYTELLING.** (2 cr)
Past and present needs for storytelling; sources and selection of suitable stories; experience in telling folk tales, fairy tales, realistic stories.
- 3-322. CHILDREN'S LITERATURE.** (3 cr)
Purpose of reading in the elementary school; bases of selecting materials for extensive readings; analysis of studies of children's interests; extensive critical survey of old and new materials for children's reading.
- 3-377. TEACHING READING—ELEMENTARY.** (3 cr)
Methods, materials, and research findings related to the teaching of reading at all levels of the elementary school.
- 3-393. THE NURSERY SCHOOL.** (3 cr; prereq jr and 3-101 or #; 3 hrs lect, 1 hr observation)
Origin, types, organization, and function of nursery schools; nursery school curricula, daily programs, equipment, and materials suitable for the 2-4 year-old child.

- 3-395. THE KINDERGARTEN.** (4 cr; prereq jr and 3-101 or #; 4 hrs lect, 1 hr observation)
Origin, organization, and function of kindergarten; kindergarten curriculum with special emphasis on home-school relations, daily programs, teaching methods, equipment, materials, and records suitable for the 5-6 year-old child.
- 3-401. CURRICULAR CONSIDERATIONS AND MEDIA.** (5 cr; prereq admission to elementary teacher education and 3-101; 4 hrs lect, 2 hrs lab)
Organizational plans, history of education, human relationships, sex education, report cards, parent conferences, special education, individualized instruction, operation of audio-visual equipment, use of IMC materials.
- 3-410/3-411/3-412. ELEMENTARY SCHOOL FIELD EXPERIENCES.** (1-2 cr each; prereq #; 4 hrs participation in area schools per wk per cr)
First-hand experiences in working with elementary school teachers and pupils; work supervised by University coordinator in cooperation with the elementary principal.
- 3-504. PROFESSIONAL QUARTER.** (15 cr; prereq sr, kindergarten-primary major, Δ)
Kindergarten-primary student teaching, instructional strategies, classroom management, professional problems of teachers.
- 3-507. STUDENT TEACHING—KINDERGARTEN, PRIMARY.** (1-7 cr; prereq 3-504 or #)
- 3-509. PROFESSIONAL QUARTER.** (15 cr; prereq sr, elementary education major, Δ)
Elementary student teaching, instructional strategies, classroom management, professional problems of teachers.
- 3-512. STUDENT TEACHING—ELEMENTARY SCHOOLS.** (1-7 cr; prereq 3-509 or #)
- 3-530. TEACHING HANDICAPPED CHILDREN.** (6 cr; prereq other requirements as stated under "Application for Student Teaching")
Supervised teaching experience with handicapped children plus periodic seminars.
- 5-312. TRENDS IN LANGUAGE ARTS—ELEMENTARY.** (3 cr; prereq 9 cr in education)
Improvement of instruction in language, grammar, spelling, and handwriting; results of scientific investigations; use of standardized and informal tests; remedial work.
- 5-344. TEACHING SCIENCE—ELEMENTARY.** (3 cr; prereq 9 cr in education)
Emphasis on resources and materials and their application to the elementary grades.
- 5-345. TRENDS IN SCIENCE—ELEMENTARY.** (3 cr; prereq 5-344 or #)
Contemporary curriculum developments in materials and methods for elementary school science. Criteria for science program evaluation.
- 5-355. TEACHING MATHEMATICS—ELEMENTARY.** (3 cr; prereq Math 1-080)
Functions of mathematics instruction; curriculum studies; development of socialized units, measurement and diagnosis; experimental research on methods of mathematics instruction; literature on mathematics.
- 5-356. MODERN MATHEMATICS—ELEMENTARY.** (3 cr; prereq Math 1-080)
Discussion of modern programs in elementary mathematics, with an inclusion of newer content growing out of current experimental activities in this area of learning.
- 5-357. TRENDS IN MATHEMATICS—ELEMENTARY.** (3 cr; prereq 5-355 or #)
Contemporary literature, trends and experimentation with content; criteria for program evaluation.
- 5-358. LABORATORY MATHEMATICS TEACHING.** (3 cr; prereq 5-355 or #; 2 hrs lect, 2 hrs lab)
Theory and materials for development of a laboratory approach to elementary school mathematics instruction. Criteria for evaluation of materials; development of instructional units and programs.
- 5-366. TEACHING SOCIAL STUDIES—ELEMENTARY.** (3 cr)
Content and organization of social studies programs; understanding and improving the learning situation; effective use of materials.
- 5-367. TRENDS IN SOCIAL STUDIES—ELEMENTARY.** (3 cr; prereq tchg exper, #, and 5-366)
Printed, audio-visual, and other materials; investigation and evaluation of teaching materials and devices.
- 5-378. TRENDS IN READING—ELEMENTARY.** (3 cr; prereq Educ 5-370, Educ 5-672, Educ 5-673, and #)
Objectives, techniques, and materials of elementary reading; survey of reading research; principles of supervision and curriculum development in reading.

Section 2—Major-Minor Requirements and Courses

- 5-379. MATERIALS IN READING—ELEMENTARY.** (3 cr; prereq tchg exper or #)
Analysis and evaluation of materials for reading instruction; consideration of programmed, basal, linguistic, and other types of materials. Laboratory projects and demonstrations of techniques of instruction; criteria for selection of materials and techniques for students with special needs.
- 5-394. TRENDS IN KINDERGARTEN EDUCATION.** (3 cr; prereq 3-395 or tchg exper)
Current practices in kindergarten teaching, evaluated in light of research in child development and kindergarten teaching.
- 5-401. ELEMENTARY SCHOOL CURRICULUM.** (3 cr; prereq #)
Curriculum practices, issues, and trends in the modern elementary school; survey of research studies relating to all areas of instruction and analysis of representative programs.
- 5-402. ELEMENTARY SCHOOL SUPERVISION.** (3 cr; prereq #)
Functions and duties of supervisors in improving instruction; specific techniques; likely problems; means of evaluating practical teaching situations.

Secondary Education (SeEd)

- 1-201. TEACHER EDUCATION, PHASE I.** (2 cr)
Orientation and admission to teacher education: classroom observations; study of the nature of teaching; assessment of self as potential teacher; personal goal setting.
- 3-101. TEACHER EDUCATION, PHASE II.** (7 cr; prereq admission to the secondary teacher education program)
Analysis of learning behaviors, adolescent development, teaching procedures in general, pupil behavior patterns, the nature of intergroup relations. Information about drugs. Classroom experience as tutor and aide. Self-evaluation with particular emphasis on exploring interpersonal relations.
- 3-201. TEACHER EDUCATION, PHASE III.** (7 cr; prereq 3-101)
Laboratory experience with: learning behaviors; adolescent behaviors; instructional strategies, media and materials appropriate to the subject taught (and to drug education). Continued self-evaluation with emphasis on improving interpersonal relations.
- 3-222. TEACHING MATHEMATICS—SECONDARY.** (3 cr)
Purposes, curriculum, materials, methods of instruction, and evaluation procedures applicable to teaching mathematics.
- 3-233. TEACHING SCIENCE—SECONDARY.** (3 cr)
Aims of secondary school science; science teaching techniques; laboratory organization; use of community resources in developing the curriculum; appropriate means for evaluating teaching.
- 3-244. TEACHING SOCIAL STUDIES—SECONDARY.** (3 cr)
Social studies objectives; curriculum design; use of resource materials; most effective teaching methods; instruction planning; evaluation procedures.
- 3-261. METHODS OF TEACHING ECONOMICS.** (1 cr; prereq #; offered when feasible)
Techniques and problems of teaching economics, consumer education, business law, and other basic business subjects.
- 3-263. METHODS OF TEACHING TYPEWRITING.** (1 cr; prereq BA 1-043 and #)
Techniques and problems of teaching typewriting and office practice.
- 3-265. METHODS OF TEACHING BOOKKEEPING.** (1 cr; prereq BA 1-505 and #)
Techniques and problems of teaching bookkeeping.
- 3-267. METHODS OF TEACHING SHORTHAND.** (1 cr; prereq BA 1-049 or ¶BA 1-049 or #)
Techniques and problems of teaching shorthand and transcription.
- 3-301. TEACHER EDUCATION, PHASE IV.** (10 cr; prereq 3-201)
Supervised practicum. Teaching adolescents; demonstrating subject matter competencies; using multi-media and teaching materials; experience in team planning; emphasis on personalizing instruction and human relation in the classroom; self-evaluation.
- 3-401. TEACHER EDUCATION, PHASE V.** (4 cr; prereq 3-301 or ¶3-301)
Closure experiences for preservice teachers. Study of contemporary issues, structure of education, professional activities of teachers, assistance in obtaining a position; assessment of personal philosophy of education, growth in self-awareness and interpersonal relations.

- 3-501, 3-503, 3-505. STUDENT TEACHING—SECONDARY SCHOOLS.** (7 cr each for 3-501 and 3-503, 1-7 cr for 3-505; 3-501 and 3-503 required...3-505 is optional; 3-501 and 3-503 may be taken concurrently or spread over 2 qtrs; each requires a 3-hr block of time during each school day exclusive of travel time, plus 1 hr wkly for conference; approval of director of student teaching required)
- 5-212. LITERATURE FOR ADOLESCENTS.** (4 cr; prereq #)
Background for pupil guidance in extensive reading in junior and senior high schools; analysis of studies of adolescent choices in literature; principles of selection; critical reading in broad fields of literary, biographical, historical, scientific, and vocational interests of boys and girls.
- 5-215. READING IN SECONDARY SCHOOLS.** (4 cr, §5-213; prereq 9 cr in education)
Teaching procedures, objectives, and materials; emphasis upon teaching of reading in various subject-matter fields, practicum experience.
- 5-223. ADVANCED COURSE: MATHEMATICS TEACHING.** (3 cr; prereq exper in tchg mathematics and/or #)
Methods, materials, and curriculum development; preparation and evaluation of tests, individually prescribed instructional programs, and other materials of instruction; principles of mathematics learning; problem solving; organization of programs for the slow learner and gifted.
- 5-225. MATHEMATICS EDUCATION: CURRENT TRENDS.** (3 cr; prereq 5-223 and #)
Trends and experimentation with content; criteria for local program development and evaluation; review of research and current literature; new school organizational patterns; in-service responsibilities.
- 5-227. COMPUTERS IN MATHEMATICS INSTRUCTION.** (3 cr; prereq #)
The role of the computer in mathematics instruction; the contribution of the computer to concept formation, computational skill and problem solving; equipment and programming language; programming; instructional materials.
- 5-233. SECONDARY SCHOOL CURRICULUM.** (3 cr; prereq #)
Organization and design of the curriculum with special consideration of the issues, problems, trends, and recommendations for a modern high school program; analysis of selected curricula and core curriculum plans.
- 5-234. CURRENT SECONDARY SCIENCE TEACHING.** (3 cr; prereq 3-233 or exper in science tchg or #)
New science curricula, their philosophy, materials, and methods of instruction, evaluation of the curricula.
- 5-235. TEACHING COOPERATIVE CLASSES.** (3 cr; offered when feasible)
For cooperative part-time distributive, office, miscellaneous trades, and diversified occupations classes.
- 5-241. SOCIAL STUDIES MATERIALS LABORATORY.** (3 cr; prereq tchg exper, #, and 3-244)
Printed and audio-visual materials useful in social studies classes.
- 5-243. CURRENT SOCIAL STUDIES DEVELOPMENTS.** (3 cr; prereq sr, 3-244 or #)
Survey of contemporary literature, curricular trends, and developments in methods.
- 5-261. TEACHING SECRETARIAL SUBJECTS.** (3 cr; prereq 3-263 and 3-267 or #)
Recent research and trends in teaching typewriting, shorthand, and office practice.
- 5-262. TEACHING DATA PROCESSING SUBJECTS.** (3 cr; prereq 3-265 or #; offered when feasible)
Advanced course in methods of teaching bookkeeping and related data processing courses at the secondary and collegiate levels, guidance information, recent research and trends.
- 5-263. TEACHING BASIC BUSINESS SUBJECTS.** (3 cr; prereq #; offered when feasible)
Recent trends and developments in teaching junior business training, economic geography, marketing, business law, consumer education, and bookkeeping.
- 5-265. COORDINATION TECHNIQUE.** (3 cr; prereq #; offered when feasible)
Problems of coordinators in the cooperative part-time program. Guidance and selection; placing of students in work stations; assisting job adjustments; developing the training program.
- 5-271. STUDENT ORGANIZATIONS AND ACTIVITIES.** (3 cr; prereq #)
Types of organizations and activities in junior and senior high schools; aims and values; practices in organizing, administering, and supervising; evaluation.

Section 2—Major-Minor Requirements and Courses

- 5-281. DRIVER EDUCATION I.** (4 cr [no more than 4 cr of 5-281/5-283 may be applied toward the M.A. degree])
History, background, and general theory of driver education and traffic safety. Preparation for the classroom phase of driver education with an introduction to the in-car program.
- 5-283. DRIVER EDUCATION II.** (4 cr [no more than 4 cr of 5-281/5-283 may be applied toward the M.A. degree]; prereq 5-281)
Overview of SeEd 5-281. Thorough study of all phases of the in-car program and the traffic safety problem as they relate to driver education; application of theory in practical laboratory experience.
- 5-285. BEHAVIORAL FACTORS: TRAFFIC PROBLEM.** (3 cr; prereq 5-281, 5-283, Ind 3-950)
Emphasis on attitudes, motivation, and adjustment and their relationship to unsafe driving. Principles and methods appropriate in identifying, understanding, and modifying unsatisfactory behavior. Review of research on behavioral aspects of accident causation and behavioral change.
- 5-287. PHYSICAL FACTORS: TRAFFIC PROBLEM.** (3 cr; prereq 5-281, 5-283, Ind 3-950)
The planning, design, and operation of the highway transportation system in the United States with emphasis on the implication for safe, efficient, and economic driving.
- 5-289. HIGHWAY TRAFFIC ADMINISTRATION.** (3 cr; prereq 5-281, 5-283, Ind 3-950)
The United States highway transportation system, with emphasis on safe, efficient, and economic motor vehicle operation. Activities and agencies concerned with increasing efficiency of the transportation system. System's development; components; social, economic, and political impacts.
- 8-222. SUPERVISION OF SECONDARY INSTRUCTION.** (3 cr; prereq PsyF 5-611 or #)
Present status, proper scope and function, principles, application to improvement of instruction.

Special Education (SpEd)

- 5-221. PROBLEMS IN MENTAL DEFICIENCY.** (3 cr; prereq 5-301 or #; offered when feasible)
Diagnosis, care, training; social and vocational problems; legal aspects.
- 5-222. INTRODUCTION TO MENTAL RETARDATION.** (3 cr; prereq 5-301; offered when feasible)
Issues which relate to educational practices; community planning, educational philosophy, administration and organization, and programming.
- 5-223. ELEMENTARY EDUCABLE RETARDED.** (3 cr; prereq 5-222 or #; offered when feasible)
Curriculum content, materials, and methods of instruction for educable mentally retarded children. Preparation of units and development of teaching aids.
- 5-300. SPECIAL EDUCATION SEMINAR.** (1 cr [may be repeated for a maximum of 6 cr]; prereq #)
Opportunity for in-depth dialogue on practices, trends, issues, and problems pertinent to the student's selected area in special education.
- 5-301. EXCEPTIONALITY AND CURRICULUM.** (3 cr, §5-220; prereq ¶5-300 and ¶5-600 or #)
Information base dealing with the range of exceptionalities requiring instructional differentiation. Includes selected aspects of sensory, motor, cognitive, and social functioning.
- 5-302. ANALYSIS OF INSTRUCTION.** (3 cr; prereq ¶5-600 or #)
Specific procedures for analysis of curriculum, teacher, and student interactions for evaluating the learning processes of exceptional children.
- 5-303. DIAGNOSTIC INSTRUCTION.** (3 cr; prereq ¶5-600 or #)
Specific procedures for assessing individual perceptual, cognitive, and social function of exceptional children. Acquisition of selected instructional competencies.
- 5-304. BEHAVIOR-DISORDERED CHILDREN.** (3 cr; prereq 9 cr in education or psychology or #; offered when feasible)
Theoretical approaches to viewing behavior-disordered children. Implications of each for educational management.

- 5-305. EXCEPTIONALITY IN THE CLASSROOM.** (3 cr; prereq 9 cr in education or psychology or #; offered when feasible)
Practical methods, materials, and managerial skills to assist the classroom teacher in differentiating instruction for exceptional children in the regular classroom.
- 5-371. CLINICAL PROCEDURES WITH CHILDREN.** (3 cr; primarily for students not majoring in clinical psychology; prereq 12 cr in psychology, educational psychology, sociology, or child psychology; offered when feasible)
Methods of clinical psychology; basic concepts and research problems in clinical work with children.
- 5-400. WORKSHOP: (Various Titles To Be Assigned).** (1 to 6 cr each offering [no more than a total of 6 cr can be applied to a Master's degree program]; prereq tchg exper and #)
- 5-600. SPECIAL AREA PRACTICUM.** (1-4 cr [may be repeated for a maximum of 12 cr]; prereq #)
Direct observational and instructional experience with exceptional children.
- 5-900. SPECIAL AREA PROJECT.** (1-4 cr; prereq #)
Opportunity for an advanced student to undertake an independent project which would serve to substantially further either his theoretical knowledge base or professional competencies.

ENGINEERING

(Science and Mathematics Division)

See Pre-Engineering Program, pages 179-181.

COURSES

- EG 1-025. ENGINEERING GRAPHICS.** (4 cr; 3 hrs lect, 4 hrs lab)
Engineering representation and analysis of systems of projection; the coordinate system, graphical solution of space problems, intersections, and developments. Precision in graphics and techniques of sketching; pictorial projection systems, size description, standard and simplified practices applied to graphic communication.
- MM 1-015. STATICS.** (4 cr; prereq Math 1-287, Phys 1-031)
Vector algebra. Applications of the equations of equilibrium to the analysis of simple engineering structures and machines. Nature and influence of friction. Elementary theory of statically determinate framed structures. Deformation of structures with axially loaded elements.
- MM 1-016. DEFORMABLE BODY MECHANICS.** (4 cr; prereq 1-015 and Math 3-350)
Introductory treatment of stress and strain at a point. Stress-strain relation in two dimensions. Linear theory of torsion. Bending stresses. Deflection of determinate and indeterminate beams. Instability.

ENGLISH (Engl)

Advisers—Professors Duncan, W. Glick, Hart, Levang, Owens, Stensland, Tezla; Associate Professors Davis, Schroeder; Assistant Professors Bacig, Hols, Jankofsky; Instructors Dohrenburg, Niemi

See Section 4 for master of arts degree program in English.

Honors Program—By invitation of English faculty. Overall 3.00 GPA with 3.20 GPA required in major. Engl 3-596, Senior Honors Seminar, is required, with emphasis on independent study and intensive study of selected literary problems. See department head for further details.

MAJOR IN ENGLISH FOR THE B.A. DEGREE

Total requirement: 44 credits in English in addition to Liberal Education Requirement A, Freshman Composition, including at least 27 Upper Division credits.

This major requires no foreign language, though it is recommended for all students.

Suggested plan particularly for those intending to enter graduate school:

At least 1-2 years of foreign language
Engl 1-905—Introduction to Literature (4)
One course from the following: Engl 1-523,
1-533, 1-543, 1-553, 1-565, 1-566 (4)
Engl 5-221 or 5-222—Shakespeare (4)
Engl 5-311—Chaucer (5)
Engl 5-331—Milton (4)

Engl 5-811—Introduction to Modern English (4)
Two courses from the following: Engl 3-573, 3-574, 3-575—American Literature; any other course in American literature (8)
Electives in English courses numbered 3-000 or above (12)

MINOR IN ENGLISH FOR THE B.A. DEGREE

Engl 1-905—Introduction to Literature (4)
Two courses from the following: Engl 1-523, 1-533, 1-543, 1-553, 1-565, 1-566 (8)
One course from the following: Engl 3-573, 3-574, 3-575—American Literature (4)

Engl 5-221—Shakespeare (4)
Electives in English courses numbered 3-000 or above (12)
Total (32) (in addition to Liberal Education Requirement A, Freshman Composition)

MAJOR IN ENGLISH FOR THE B.S. DEGREE

Required of students intending to seek teacher certification.

Engl 1-905—Introduction to Literature (4)
Engl 3-902—Composition for Teachers (4)
Engl 3-911—Teaching the Language Arts (2)
Engl 5-221 or 5-222—Shakespeare (4)
Engl 5-811—Introduction to Modern English (4)
Engl 5-821—History of the English Language (4)
Any *one* course from the following: English Department courses in drama or poetry, Engl 1-112 (4); Spch 1-701 (3)
Any *one* course from British literature courses numbered below 3-000 (4)
Any *two* courses from British literature courses numbered 3-000 or above (8)

Any *two* courses from American literature courses numbered 3-000 or above, one of which must be Engl 3-573 or 3-574 or 3-575 (8)
Any *three* courses from the following: English courses numbered 3-000 or above not used in satisfying requirements in other categories; SeEd 5-212, Literature for Adolescents; SeEd 5-215, Reading in Secondary Schools (12)

Total (57-58) (in addition to Liberal Education Requirement A, Freshman Composition)

A student's program must include at least one course in 20th-century British or American literature.

Students are urged to concentrate (take 3 or 4 courses) in one field of literature or language, such as the genres, American literature, British literature, literary criticism, advanced writing, linguistics, etc.

MINOR IN ENGLISH FOR THE B.S. DEGREE

B.S. Minor—Secondary Education

Required of students intending to seek teacher certification.

Engl 1-905—Introduction to Literature (4)
Engl 3-902—Composition for Teachers (4)

Engl 3-911—Teaching the Language Arts (2)

Engl 5-811—Introduction to Modern English (4)

Any *one* course from the following: English Department courses in drama or poetry; Engl 1-112 (4); Spch 1-701 (3)

Any *one* course from the following: English Department courses below 3-000 (excluding 1-106, 1-107, 1-905); Hum 1-021, 1-022, 1-023 (4)

Any *one* course from the following: Engl 3-573, 3-574, 3-575—American Literature (4)

Any *one* course from period or genre courses in British literature above 3-000 (4)

Any *three* courses from the following: English courses above 3-000 not used in satisfying requirements in other categories; SeEd 5-212, Literature for Adolescents; SeEd 5-215, Reading in Secondary Schools (12)

Total (41-42) (in addition to Liberal Education Requirement A, Freshman Composition)

A student's program must include at least one course in 20th-century British or American literature.

Students are urged to concentrate (take 3 or 4 courses) in one field of literature or language, such as the genres, American literature, British literature, literary criticism, advanced writing, linguistics, etc.

B.S. Minor—Elementary Education

Required of students intending to seek teacher certification.

Engl 1-112—Advanced Writing (4)

Engl 1-504 or 1-505—Masterworks of English Literature (4)

Engl 1-811—Introduction to Language (4)

Engl 3-574 or 3-575—American Literature (4)

Any *two* courses from the following: Hum 1-021, 1-022, 1-023; Engl 1-905, 3-504, 3-505 (8)

Any *two* English courses other than those taken above, one of which must be numbered 3-000 or above (8)

Total (32) (in addition to Liberal Education Requirement A, Freshman Composition)

COURSES

1-106/1-107. FRESHMAN COMPOSITION. (4 cr each, §1-101/1-102/1-103)

Expository and argumentative writing.

1-111, 1-112. ADVANCED WRITING. (4 cr each, §1-104, §1-105; prereq Liberal Education Requirement A, Freshman Composition)

1-111: Writing of essays and articles, stressing adequate content, logical analysis and organization, and general interest and popular appeal. 1-112: Writing of description and narration, stressing methods and technique, particularly in simple narratives of general and technical interest—biography, travel, expanded incident, process, sketch.

1-504, 1-505. MASTERWORKS OF ENGLISH LITERATURE. (4 cr each, §1-501, §1-502, §1-503, §1-510, §1-511, §1-512)

A chronological study of selected masterworks of English literature.

1-523. MEDIEVAL LITERATURE I. (4 cr, §5-510)

A survey of the forms of life, thought, and art from the 12th to the 15th century with special regard to English literature of the Middle Ages.

1-533. 16TH-CENTURY ENGLISH LITERATURE I. (4 cr, §5-530, §5-531, §5-532; offered when feasible)

Readings for the beginner in works of the period, including Shakespeare.

1-543. 17TH-CENTURY ENGLISH LITERATURE I. (4 cr, §5-540, §5-541, §5-542)

Readings for the beginner in works of the period, including Milton.

1-553. 18TH-CENTURY ENGLISH LITERATURE I. (4 cr, §5-550, §5-551, §5-552)

Readings for the beginner in works of the period.

1-561. 19TH-CENTURY AMERICAN LITERATURE. (4 cr, §1-550; not for English majors or minors)

Major American writers; particularly for sophomores who are not English majors or minors, but who wish to become acquainted with the principal works in the American literary heritage.

Section 2—Major-Minor Requirements and Courses

- 1-565. ROMANTIC PROSE AND POETRY I.** (4 cr, §5-560, §5-561)
Readings for the beginner in English literature, 1790-1830.
- 1-566. VICTORIAN PROSE AND POETRY I.** (4 cr, §5-562, §5-563, §5-564)
Readings for the beginner in English literature, 1830-1901.
- 1-572, 1-573. 20TH-CENTURY LITERATURE.** (4 cr each, §1-570, §1-571; for students in all depts, and not particularly for those specializing in English)
Readings in British and American literature since the 1890's, arranged by types of discourse. 1-572: Poetry and drama. 1-573: The novel since Thomas Hardy; a general introduction to intelligent reading of literature.
- 1-811. INTRODUCTION TO LANGUAGE.** (4 cr, §1-810)
The study of the nature of language and a survey of the branches of linguistic science.
- 1-905. INTRODUCTION TO LITERATURE.** (4 cr)
Introduction to the principal literary forms, and methods of critical analysis and interpretation of fiction, poetry, and drama.
- 3-204. DEVELOPMENT OF DRAMATIC LITERATURE.** (4 cr, §3-201, §3-202, §3-203; offered when feasible)
The study of selected masterworks from antiquity to modern times.
- 3-271, 3-371, 3-471. CONTEMPORARY LITERATURE.** (4 cr each; for students in all depts, not particularly for those specializing in English)
Readings in American and British literature since 1945 arranged by types of discourse. 3-271: Drama. 3-371: Poetry. 3-471: Novel.
- 3-504, 3-505. WORLD LITERATURE.** (4 cr each, §3-501, §3-502, §3-503; for students in all depts, not particularly for those specializing in English)
Great works of literature from the Greek period to the 20th century.
- 3-511. CONTINENTAL LITERATURE.** (4 cr, §3-510; students may substitute Fr 3-511, Ger 3-511, or Span 3-511 for Engl 3-511 in selecting electives in English and may take all four courses if they wish; offered when feasible)
Reading of continental literature in translation.
- 3-573, 3-574, 3-575. AMERICAN LITERATURE.** (4 cr each, §3-570, §3-571, §3-572)
Notable American authors from the 17th century to the present. 3-573: Colonial and Revolutionary periods. 3-574: The 19th century. 3-575: The 20th century.
- 3-596. SENIOR HONORS SEMINAR.** (4 cr [may be repeated for a maximum of 12 cr and may be used in place of required B.S. courses with permission of department head], §3-595; prereq English major status, selection by English faculty)
- 3-902. COMPOSITION FOR TEACHERS.** (4 cr, §3-901)
Expository writing, with an emphasis on knowledge of current usage and the principles of rhetoric.
- 3-910. TEACHING THE LANGUAGE ARTS.** (4 cr; prereq #)
Problems in the teaching of the language arts; suggested methods and materials of instruction.
- 3-911. TEACHING THE LANGUAGE ARTS.** (2 cr; prereq completion of SeEd 3-301; for students who enroll in the new secondary education program)
Problems in the teaching of the language arts.
- 5-111. THE SHORT STORY.** (4 cr, §3-110; prereq 1-112) Davis
Writing of the short story with emphasis on structure and techniques learned from critical reading and classroom analysis.
- 5-202. INTERPRETATION OF DRAMA.** (4 cr, §5-201; prereq 8 cr of lit in this dept; offered when feasible)
Certain technical aspects of reading drama in relation to meaning.
- 5-221. SHAKESPEARE.** (4 cr, §3-220, §3-221; prereq 8 cr of lit in this dept)
Introductory study, using selected plays from the several periods of Shakespeare's career. Recommended as the first course in Shakespeare.
- 5-222. SHAKESPEARE.** (4 cr, §5-220; prereq 8 cr of lit in this dept)
Concentrated study of selected plays, with attention to Shakespearean criticism and scholarship. Recommended as the second course in Shakespeare.
- 5-251. AMERICAN DRAMA.** (4 cr, §5-250; prereq 8 cr of lit in this dept) Hart
Critical survey, primarily of period from 1914 to present, with some attention to historical and cultural background; some representative plays of 18th, 19th, and early 20th centuries.

- 5-271. **MODERN BRITISH DRAMA.** (4 cr, §5-270; prereq 8 cr of lit in this dept) Duncan
Historical study of British drama from 1900 to the present: Shaw, Synge, O'Casey, Fry, Osborne, Beckett, Pinter, and others.
- 5-303. **THE INTERPRETATION OF POETRY.** (4 cr, §5-301/5-302) Tezla
Certain technical aspects of poetry in relation to meaning.
- 5-311. **CHAUCCER.** (5 cr, §3-310, §5-310) Jankofsky
Introduction to Middle English. Reading and analysis of the works of Chaucer.
- 5-331. **MILTON.** (4 cr, §5-330; prereq 8 cr of lit in this dept) Duncan
Minor poems, *Areopagitica*, *Paradise Lost*, and *Samson Agonistes*.
- 5-411. **INTERPRETATION OF THE NOVEL.** (4 cr, §5-410; prereq 8 cr of lit in this dept) Owens
Important technical aspects of the novel in relation to meaning.
- 5-443, 5-444. **ENGLISH NOVEL.** (4 cr each, §5-440, §5-441, §5-442; prereq 8 cr of lit in this dept) Owens
Development of the British novel. 5-443: Defoe to Trollope. 5-444: George Eliot to present.
- 5-452. **AMERICAN NOVEL.** (5 cr, §5-450, §5-451; prereq 8 cr of lit in this dept) Hart
History of the American novel in its relations to patterns of American thought.
- 5-471. **HEMINGWAY AND FAULKNER.** (4 cr, §5-470; prereq 8 cr of lit in this dept) Hart
Literary development and analysis of selected works.
- 5-523. **MEDIEVAL LITERATURE II.** (4 cr, §5-510) Jankofsky
General readings in Middle English literature and detailed study of selected works exclusive of Chaucer.
- 5-533. **16TH-CENTURY ENGLISH LITERATURE II.** (4 cr, §5-530 and 5-531 and 5-532; prereq 8 cr of lit in this dept; offered when feasible) Levang
Readings in the works of the period, excluding Shakespeare's drama.
- 5-543. **17TH-CENTURY ENGLISH LITERATURE II.** (4 cr, §5-540 and 5-541 and 5-542; prereq 8 cr of lit in this dept) Duncan
Readings in the period, excluding Milton.
- 5-553. **18TH-CENTURY ENGLISH LITERATURE II.** (4 cr, §5-550 and 5-551 and 5-552; prereq 8 cr of lit in this dept) Owens
English life and letters from 1700 to 1798.
- 5-565. **ROMANTIC PROSE AND POETRY II.** (4 cr, §5-560 and 5-561; prereq 8 cr of lit in this dept) Tezla
English literature, 1790-1830.
- 5-566. **VICTORIAN PROSE AND POETRY II.** (4 cr, §5-562 and 5-563 and 5-564; prereq 8 cr of lit in this dept) Crockett
English literature, 1830-1901.
- 5-571. **EMERSON, THOREAU, WHITMAN.** (4 cr, §5-570; prereq 8 cr of lit in this dept) W Glick
Literary development and analysis of selected works.
- 5-572. **HAWTHORNE, MELVILLE, TWAIN.** (4 cr, §5-573; prereq 8 cr of lit in this dept) W Glick
Literary development and analysis of selected works.
- 5-581. **MODERN BRITISH POETRY AND CRITICISM.** (4 cr, §5-580; prereq 8 cr of lit in this dept) Duncan
British poetry and criticism from 1900 to the present. Yeats, Eliot, Richards, Leavis, Auden, Dylan Thomas, Philip Larkin, John Wain, and others.
- 5-590. **INDEPENDENT READING.** (1-4 cr [may be repeated for a maximum of 8 cr], §3-590, §8-510; prereq # and Δ)
Each student chooses his readings in conference with his instructor.
- 5-611. **LITERARY CRITICISM.** (4 cr, §5-610; prereq #; offered when feasible)
Reading and analysis of selected critical writings from Aristotle to Arnold.
- 5-671. **MODERN AMERICAN LITERARY CRITICISM.** (4 cr, §5-670; prereq 8 cr of lit in this dept or #; offered when feasible) Hart
Readings in the principal schools of modern American criticism, together with some application of their chief critical tenets to selected literary works.
- 5-811. **INTRODUCTION TO MODERN ENGLISH.** (4 cr, §5-810)
Modern theories of English grammar.

Section 2—Major-Minor Requirements and Courses

- 5-821. HISTORY OF THE ENGLISH LANGUAGE.** (4 cr, §5-820; prereq 5-811 or #)
History of sounds, word stock, and structures of the English language; changes in the language since the Renaissance.
- 5-831. SOCIOLINGUISTICS.** (4 cr, §5-830; prereq 5-811; offered when feasible)
Communicative behavior in social groups, especially the conventions of dialects and stylistic variation, linguistic interference, and paralinguistic behavior of dominant cultures and subcultures.
- 5-910. BIBLIOGRAPHY AND LITERARY RESEARCH.** (2 cr; prereq #; offered when feasible)
Basic library reference works, scholarly and critical journals, bibliographies of periods and prominent literary figures; exercises and problems in methods and exposition of research.
- 5-920. ADVANCED ENGLISH METHODS—SECONDARY.** (4 cr, §SeEd 8-211; prereq 3-910; offered summer only)
Evaluation of present content and method in the light of research and recent trends in teaching.
- 8-530. GRADUATE SEMINAR.** (4 cr [may be repeated for cr])
- 8-901. TEACHING FRESHMAN COMPOSITION.** (1 cr [may be repeated for a maximum of 6 cr]...tehg assts in English Department are required to attend for 1 cr, and may elect in subsequent qtrs to conduct research and experiments in freshman composition for a maximum of 5 addtl cr; prereq #)
Seminar in methods, materials, and objectives of teaching freshman composition.
- 8-910. PRACTICUM IN TEACHING COMPOSITION.** (4 cr)
Teaching, tutoring, and assisting in freshman composition courses, experience in the preparation of materials, micro-teaching, and grading student work.
- 8-930. PRACTICUM IN TEACHING LITERATURE.** (4 cr; prereq 8 cr of lit or #)
Teaching in sophomore literature courses; experience in preparation of supplementary materials, consultation with students, and assisting instructors in grading student work.

FRENCH (Fr)

(Language Department)

Advisers—Assistant Professor Jenny; Instructors Jukich, J. Smith

MAJOR IN FRENCH FOR THE B.A. DEGREE

Fr 1-101/1-102/1-103—Beginning French (15)	examination or documentation from another institution
Fr 1-201/1-202/1-203—Intermediate French (9)	Plus 28 credit hours of Upper Division courses in French; up to 8 credits may be from other departments directly relevant to the student's program
Fr 3-121/3-122/3-123—Advanced French (12)	
(or) A language competence equivalent to Fr 3-123, which may be determined by	Total (64)

A student majoring in French must pass an oral proficiency examination which should be taken while the student is enrolled in the "Advanced French" sequence; the examination may be repeated.

MINOR IN FRENCH FOR THE B.A. DEGREE

Fr 1-101/1-102/1-103—Beginning French (15)	examination or documentation from another institution
Fr 1-201/1-202/1-203—Intermediate French (9)	Plus 8 credit hours of Upper Division courses in French
Fr 3-121/3-122/3-123—Advanced French (12)	
(or) A language competence equivalent to Fr 3-123 which may be determined by	Total (44)

MAJOR IN FRENCH FOR THE B.S. DEGREE

Required for students intending to seek teacher certification.

Fr 1-101/1-102/1-103—Beginning French (15)	A phonetics or linguistics course, such as SPA 1-990, Introduction to Phonetics (4); Engl 5-811, Introduction to Modern English (4); Span 3-152, Phonology, Morphology, and Syntax (4)
Fr 1-201/1-202/1-203—Intermediate French (9)	
Fr 3-121/3-122/3-123—Advanced French (12)	Plus 20 credit hours of Upper Division courses in French; a maximum of 5 credits may be from other departments directly relevant to the student's program
(or) A language competence equivalent to Fr 3-123, which may be determined by examination or documentation from another institution	
Lang 3-801—Teaching Nonnative Language (4)	Total (64)

A student majoring in French must pass an oral proficiency examination which should be taken while the student is enrolled in the "Advanced French" sequence; the examination may be repeated. The B.S. candidate must pass the examination before being permitted to student teach. All French B.S. majors must student teach in French for certification.

MINOR IN FRENCH FOR THE B.S. DEGREE

Required for students intending to seek teacher certification.

Fr 1-101/1-102/1-103—Beginning French (15)	Lang 3-801—Teaching Nonnative Language (4)
Fr 1-201/1-202/1-203—Intermediate French (9)	A phonetics or linguistics course, such as SPA 1-990, Introduction to Phonetics (4); Engl 5-811, Introduction to Modern English (4); Span 3-152, Phonology, Morphology, and Syntax (4)
Fr 3-121/3-122/3-123—Advanced French (12)	
(or) A language competence equivalent to Fr 3-123, which may be determined by examination or documentation from another institution	Total (44)

A student taking a B.S. minor in French must pass an oral proficiency examination which should be taken while the student is enrolled in the "Advanced French" sequence; the examination may be repeated. The candidate must pass the examination before being permitted to student teach. All French B.S. minors must student teach in French for certification.

COURSES

1-101/1-102/1-103. BEGINNING FRENCH. (5 cr each)

Grammar; reading; conversation.

1-111/1-112. BEGINNING FRENCH. (8 cr first term, 7 cr second term; offered summer only)

Grammar; reading; conversation. Covers the same material handled in the regular first-year sequence.

1-201/1-202/1-203. INTERMEDIATE FRENCH. (3 cr each; prereq 1-103)

Review of grammar. Improvement of proficiency in language skills.

1-211/1-212. INTERMEDIATE FRENCH. (5 cr first term, 4 cr second term; offered summer only)

Review of grammar. Improvement of proficiency skills. Covers the same material handled in the regular intermediate sequence.

3-121/3-122/3-123. ADVANCED FRENCH. (4 cr each, §3-101/3-102/3-103; prereq 1-203)

Composition; conversation; grammar; reading.

3-304. FRENCH CIVILIZATION. (4 cr; offered 1972-73 and alt yrs)

Major developments in French culture. Taught in English.

Section 2—Major-Minor Requirements and Courses

- 3-505. **FRENCH POETRY.** (4 cr, §3-501; prereq 1-203; offered 1973-74 and alt yrs)
- 3-511. **LITERATURE IN TRANSLATION.** (4 cr, §3-510; students may substitute Engl 3-511, Ger 3-511, or Span 3-511 for Fr 3-511 in selecting electives)
Reading of French literature in translation.
- 3-532. **17TH-CENTURY LITERATURE.** (4 cr, §3-531; prereq 3-121; offered 1972-73 and alt yrs)
- 3-543. **VOLTAIRE AND ROUSSEAU IN ENGLISH.** (4 cr, §3-541; offered 1972-73 and alt yrs)
- 3-544. **18TH-CENTURY FRENCH PROSE.** (4 cr, §3-542; prereq 3-121; offered 1973-74 and alt yrs)
- 3-573. **20TH-CENTURY NOVEL.** (4 cr; prereq 1-203; offered 1973-74 and alt yrs)
- 3-574. **20TH-CENTURY THEATER.** (4 cr; prereq 1-203; offered 1972-73 and alt yrs)
- 3-997. **SEMINAR.** (4 cr per qtr [may be repeated for a maximum of 8 cr], §3-998; prereq 1-203 and #)
- 5-552. **THE 19TH-CENTURY NOVEL.** (4 cr, §5-551; prereq 3-123 and #; offered 1973-74 and alt yrs) Jenny
- Lang 3-801. **TEACHING NONNATIVE LANGUAGE.** (4 cr; prereq 24 cr of French or #)
The theory and practice of teaching basic nonnative language skills and cultural concepts at any educational level. Applicable also to teachers of English as a foreign language.

GENERAL SCIENCE

(Science and Mathematics Division)

Adviser—Professor Duval

The major or minor in general science is designed to qualify students to teach general science and not any one of the several sciences.

MAJOR IN GENERAL SCIENCE FOR THE B.S. DEGREE

Ast 1-010—Descriptive Astronomy (3)	Math 3-030—Mathematics for Liberal Education (5)
Biol 1-105, 1-106, 1-107, 1-108—General Biology (10)	Plus elective in mathematics for which a traditional letter grade can be received (5)
Chem 1-103/1-104—General Chemistry; 1-500—Organic Chemistry (15)	Phys 1-001/1-002, 1-003—Elementary Physics (12)
(or) Chem 1-110/1-111/1-112—General Chemistry (15)	Total (63)
Geog 3-412—Weather Elements (4)	
Geol 1-110—Introductory Geology (5)	
Geol 3-131—Oceanography (4)	

MINOR IN GENERAL SCIENCE FOR THE B.S. DEGREE

Biol 1-105, 1-106, 1-107, 1-108—General Biology (10)	Geol 1-110—Introductory Geology (5)
Chem 1-103 or 1-110—General Chemistry (5)	Elective in mathematics for which a traditional letter grade can be received (5)
(or) Chem 1-103/1-104—General Chemistry (10)	Phys 1-001/1-002, 1-003—Elementary Physics (12)
(or) Chem 1-110/1-111—General Chemistry (10)	Courses selected from science (5-0)
	Total (42)

GEOGRAPHY (Geog)

Advisers—Professors Belthuis, Chamberlin, Hoag, Witzig; Associate Professor Kaups; Assistant Professor Adams; Instructor Levine

MAJOR IN GEOGRAPHY FOR THE B.A. DEGREE

A. Lower Division Courses Required

- Geog 1-303—Cultural Geography (4)
- Geog 1-312—Economic Geography (4)
- Geog 1-403—Physical Geography (4)

B. Upper Division Requirements

- Geog 3-802—Geographic Thought (4)
- One technique course from the following: Geog 3-521 and 3-611
- At least three topical courses from the following: Geog 3-103, 3-323, 3-324, 3-331, 3-341, 3-392, 3-412, 3-422, 5-306, and 5-701
- At least three regional courses from the following: Geog 3-111, 5-116, 5-133, 5-172, 5-174, 5-182, 5-201, 5-211, 5-222, 5-573
- Additional credits in geography to total 54

Total (54)

Supporting Courses Required—At least three courses in related fields having prior approval of the adviser.

Graduate Study Recommendation—The department strongly recommends that majors in geography anticipating eventual graduate school training in this field take at least 15 credits in a foreign language (or have 2 years of high school foreign language). At least 1 year of college-level mathematics also is desirable.

MAJOR IN GEOGRAPHY FOR THE B.S. DEGREE

Recommended for students intending to seek teacher certification.

A. Lower Division Courses Required

- Geog 1-303—Cultural Geography (4)
- Geog 1-305—Environmental Conservation (4)
- Geog 1-312—Economic Geography (4)
- Geog 1-403—Physical Geography (4)

B. Upper Division Requirements

- Geog 3-571—Maps and Globes for Teachers (1)
- Geog 3-802—Geographic Thought (4)
- At least three technique or topical courses from the following: Geog 3-103, 3-323, 3-324, 3-331, 3-341, 3-392, 3-412, 3-422, 3-521, 3-611, 5-306, and 5-701
- At least three regional courses from the following: Geog 3-111, 5-116, 5-133, 5-172, 5-174, 5-182, 5-201, 5-211, 5-222, 5-573
- Additional credits in geography to total 52

Total (52)

B.S. degree majors are advised to take Geog 3-571 (Maps and Globes for Teachers) and 3-802 (Geographic Thought) in the junior year to avoid conflict with student teaching.

MINOR IN GEOGRAPHY FOR THE B.A. OR B.S. DEGREES

A. Lower Division Courses Required

Geog 1-201—Man and His Habitat (4)

Geog 1-403—Physical Geography (4)

One of the following:

Geog 1-303—Cultural Geography (4)

Geog 1-305—Environmental Conservation (4)

Geog 1-312—Economic Geography (4)

B. Upper Division Requirements

At least two topical courses from the following: Geog 3-103, 3-323, 3-324, 3-331, 3-341, 3-392, 3-412, 3-422, 5-306, and 5-701

At least two regional courses from the following: Geog 3-111, 5-116, 5-133, 5-172, 5-174, 5-182, 5-201, 5-211, 5-222, 5-573

Additional Upper Division credits, if necessary, to total 16

Total (28)

B.S. (teaching degree) minors must practice teach in geography before being recommended for certification.

COURSES

1-201. MAN AND HIS HABITAT. (4 cr)

The geography of human groups in diverse physical settings. Description and analysis of favorable and unfavorable habitats for human occupation including geographic analysis of selected countries. Emphasis on man's use and misuse of his environment.

1-303. CULTURAL GEOGRAPHY. (4 cr, §1-302)

Principles of human geography including a treatment of the world's livelihood patterns, population characteristics, and settlement types.

1-305. ENVIRONMENTAL CONSERVATION. (4 cr, §1-304)

Natural resources of the earth and man's cultural modification of them. Emphasis on planning for and control of man's use of his environment.

1-312. ECONOMIC GEOGRAPHY. (4 cr, §3-323, §3-324)

Introductory survey and analysis of world patterns of economic activity. Emphasis on spatial variation of mining, manufacturing, agriculture, forestry, fishing, and transportation.

1-403. PHYSICAL GEOGRAPHY. (4 cr, §1-402)

Earth-sun relations, maps and globes, and major factors of the natural environment including water resources, landforms, weather and climate, natural vegetation, and soils.

3-103. HISTORICAL GEOGRAPHY: UNITED STATES. (4 cr, §3-102; prereq 4 cr in geography)

Geographic conditions influential in the development and settlement of the United States.

3-111. GEOGRAPHY OF MINNESOTA. (3 cr; prereq 1-403)

Physical survey followed by study of activities of man.

3-323. AGRICULTURAL GEOGRAPHY. (4 cr, §3-321; prereq 8 cr in geography)

Analysis of (a) types of farming including products, methods, tenure, disposal of products, requirements; (b) types of farming regions including location, settlement patterns, similarities, differences; and (c) production and trade of major products.

3-324. GEOGRAPHY OF INDUSTRIAL LOCATION. (4 cr, §3-322; prereq 4 cr in geography)

Locational analysis of industry and industrial patterns. Introduction to spatial theory and model building with emphasis on integrating real world phenomena with theoretical industrial location factors.

3-331. URBAN GEOGRAPHY. (3 cr; prereq 8 cr in geography or §)

Function and distribution of cities in present-day world, including analysis of their development. Emphasis on American cities, their internal structure, form, and planning processes.

- 3-341. **GEOGRAPHY OF TRANSPORTATION AND TRADE.** (4 cr; prereq 3-323 or 3-324 or #)
Large- and small-scale analysis of the distribution and pattern of various transport modes with examination of the geographical aspects of transportation systems at empirical and theoretical levels. Study of spatial variations in international trade linkages and flows and the distribution centers which service this trade.
- 3-392. **POLITICAL GEOGRAPHY.** (4 cr, §3-391; prereq 1-303 and 1-403; offered 1972-73 and alt yrs)
World states and geographical interpretation of international relations; current world problem areas and the influence of geographic settings upon them.
- 3-412. **WEATHER ELEMENTS.** (4 cr, §3-411; prereq 1-403)
Topics include atmospheric composition, structure, stability, and motion; precipitation processes, air masses, fronts, cyclones, and anticyclones; general weather patterns.
- 3-422. **CLIMATOLOGY.** (2 cr, §3-421; prereq 1-403 and 3-412)
Various climatic classifications; analysis of climatic regions of continents based on the Trewartha (modified Koppen) system. Individual student projects.
- 3-521. **CARTOGRAPHY AND MAP INTERPRETATION.** (5 cr, §3-512, §3-552; prereq 4 cr in geography and #)
Mapping of qualitative and quantitative data; thematic maps; map design. Use of maps and charts as tools in geographic research and teaching. Emphasis on interpretation and analysis of interrelationships of cultural and physical features of the earth's surface.
- 3-571. **MAPS AND GLOBES FOR TEACHERS.** (1 cr; prereq 1-303 and 1-403)
Study of wall maps and globes. Strongly recommended for B.S. geography minors.
- 3-611. **FIELD TECHNIQUES.** (4 cr; open only to jrs and srs; prereq 1-303 and 1-403 plus 6 cr in geography or #; offered when feasible)
A geographic survey of physical and cultural aspects of selected urban and rural landscapes; including basic methods of observation, measurement, recording, analysis, and presentation of field data. Training will be carried on chiefly in the field.
- 3-802. **GEOGRAPHIC THOUGHT.** (4 cr, §3-801; prereq 16 cr in geography)
Emphasis given to the development of geographic thought, introducing the student to the fundamental concepts of geography.
- 3-920. **SPECIAL PROBLEMS.** (1-3 cr [may be repeated for a maximum of 6 cr]; prereq #)
For students interested in doing advanced work in selected fields of geography.
- 5-116. **ANGLO-AMERICA.** (5 cr, §5-114, §5-115; prereq 1-303, 1-403 plus 3 cr in geography) Belthuis, Hoag
Topical study and regional presentation of physical and human geographic patterns of United States and Canada.
- 5-133. **LATIN AMERICA.** (5 cr, §3-131, §5-132; prereq 8 cr in geography) Adams
Survey of the cultural and physical diversities of Latin America. Emphasis on physical resources, historical development, population characteristics, and economic activities.
- 5-172. **WESTERN AND CENTRAL EUROPE.** (4 cr, §5-171; prereq 8 cr in geography or #) Chamberlin, Witzig
Physical and cultural geography of the countries of western and central Europe considered regionally and by a more detailed discussion of topics related to these countries.
- 5-174. **MEDITERRANEAN.** (3 cr; prereq 8 cr in geography or #; offered 1973-74 and alt yrs) Witzig
Physical and cultural geography of lands of Mediterranean Basin and Balkan Peninsula considered regionally and by individual countries.
- 5-182. **SOVIET UNION.** (4 cr, §5-181; prereq 6 cr in geography or #) Chamberlin
Character of and bases for the regional diversity of physical resources, population, agriculture, manufacturing, and transportation in the U.S.S.R.
- 5-201. **GEOGRAPHY OF SOUTHEAST ASIA.** (4 cr, §3-213; prereq 4 cr in geography or #) Levine
A topical approach to the cultural and physical geography of Malaysia, Singapore, Indonesia, Thailand, Burma, the Philippines, Laos, Vietnam, and Cambodia, with emphasis on the problems of land use, transportation, resource development, and spatial and political fragmentation.

Section 2—Major-Minor Requirements and Courses

- 5-211. GEOGRAPHY OF EAST ASIA.** (4 cr, §3-211; prereq 4 cr in geography or #)
Levine
China, Japan, and Korea as a geographic problem; physical, cultural, and political bases of traditional East Asia with analysis of contemporary agriculture, population and its growth, resource utilization and industrialization, transport, trade, and urbanization. Special emphasis on Communist China.
- 5-222. AUSTRALIA AND NEW ZEALAND.** (4 cr, §5-221; prereq 1-302, 1-402 plus 3 cr in geography) Belthuis
Geographical survey of physical and human resources of Australia and New Zealand.
- 5-306. COMPARATIVE CULTURAL GEOGRAPHY.** (4 cr, §5-305; prereq 1-303, 1-403 plus 3 cr in geography) Belthuis
A study of man and his life in his physical setting using examples mainly from underdeveloped areas from the tropics and subtropics. Will include comparisons of people of differing stages of development in similar climates.
- 5-573. GEOGRAPHY OF NORDEN.** (4 cr, §5-173; prereq 4 cr in geography or #) Kaups
Cultural and physical geography of Norden, and introduction to Scandinavian, Finnish, and Icelandic settlements in North America.
- 5-701. SETTLEMENT GEOGRAPHY.** (4 cr; prereq 8 cr in geography or #) Kaups
A cultural geographic approach to study of nonurban settlements; including location, function, and development of settlement types, and theories of settlement. Selected regions of the world.

GEOLOGY (Geol)

Advisers—Professors Marsden, Green; Associate Professors Darby, Davidson, Grant, Matsch, Ojakangas

See Section 4 for master of science degree in geology.

MAJOR IN GEOLOGY FOR THE B.A. DEGREE

Geol 1-110—Introductory Geology (5)	Geol 5-100—Field Geology (9)
Geol 3-100—Geological Field Methods (3)	Geol 5-700—Paleontology (5)
Geol 3-200—Geomorphology (4)	Electives numbered 3-000 or above in geology or chemistry, mathematics or physics courses, not listed as supporting courses below (8)
Geol 3-310/3-311/3-312—Earth Materials I-II-III (13)	
Geol 3-510/3-511—Earth Structure I-II (8)	
Geol 3-600—Economic Geology (4)	Total (59)

Supporting Courses Required—(a) Chem 1-110/1-111/1-112 or 1-120/1-121; (b) 1 year college physics; (c) Math 1-287, 3-501, 3-561.

MINOR IN GEOLOGY FOR THE B.A. OR B.S. DEGREE

Required for students intending to seek teacher certification.

Geol 1-110—Introductory Geology (5)	Electives in geology courses numbered 3-000 or above (8)
Geol 3-310/3-311/3-312—Earth Materials I-II-III (13)	
	Total (26)

COURSES

- 1-100. TOPICS IN GEOLOGY.** (1 cr [may be repeated for a maximum of 6 cr]; 2 hrs lect-rec; 5 wks)
Selected topics of geologic interest collectively related to virtually all aspects of geology with individual short courses providing in-depth analysis of selected geoscience subjects.

- 1-110. INTRODUCTORY GEOLOGY.** (5 cr; 4 hrs lect, 2 hrs lab)
An integrated study of the earth's composition, structure, and processes together with earth history and the evolution of life.
- 3-100. GEOLOGICAL FIELD METHODS.** (3 cr; prereq 3-312, 3-511)
Introduction to and use of plane table and alidade, Brunton compass, and other field instruments; study of topographic maps, geologic maps, and aerial photographs; procedures for note-taking, construction of geologic maps, and preparation of geologic reports.
- 3-120. GEOLOGY OF NORTH AMERICA.** (3 cr; prereq 1-110)
Integrated study of major physiographic and tectonic subdivisions of North America, including geologic history of the areas.
- 3-131. OCEANOGRAPHY.** (4 cr, §3-130; prereq Upper Division standing; 4 hrs lect)
First half of quarter: The history of oceans and basins; physical and chemical aspects of marine waters; processes; ocean and continental relations, resources. Second half of quarter: The marine biota; ecology of organisms; trophic levels, productivity, measuring techniques, pollution; Great Lakes as freshwater seas.
- 3-180. SEMINAR.** (1 cr; open only to geology or earth science srs; prereq #)
Oral and written presentations on topics of current significance to geoscientists. Participation by department staff.
- 3-200. GEOMORPHOLOGY.** (4 cr; prereq 1-110; 3 hrs lect, 2 hrs lab)
Geologic processes of the earth's surface environment, including weathering, mass wasting, and erosion, that produce the major elements of the landscape. Aerial photographs and topographic maps as tools for interpreting the morphology of the earth's surface. Field trips.
- 3-310/3-311/3-312. EARTH MATERIALS I-II-III.** (5/4/4 cr, §3-300/3-301/3-302; prereq 1-110 and 1 yr high school chemistry or Chem 1-103, Chem 1-110, or Chem 1-120; 3 hrs lect and 4 hrs lab for 3-310...2 hrs lect and 4 hrs lab each for 3-311 and 3-312)
The integrated study of the common and important rocks and minerals, including their origin, composition, classification, identification, and use. 3-310: Introduction to crystallography, crystal chemistry, and the use of the polarizing microscope. Field trips.
- 3-510/3-511. EARTH STRUCTURE I-II.** (4 cr each, §3-500; prereq 3-312, Math 1-185; 3 hrs lect, 2 hrs lab)
An integrated approach to the structure of the earth with emphasis on the analysis of primary and secondary crustal structures, geologic deformation and geotectonics. Laboratories will utilize aerial photos, topographic and geologic maps, and radar imagery in interpreting earth history.
- 3-600. ECONOMIC GEOLOGY.** (4 cr; prereq 3-312; 3 hrs lect, 2 hrs lab)
The geologic description, geographic distribution, and origin of economic mineral materials including petroleum, coal, and groundwater.
- 5-010. ADVANCED EARTH SCIENCE FOR TEACHERS.** (3 cr; prereq earth science sr or grad, or #, 1 hr lect, 4 hrs lab) Matsch
The investigative approach to earth science, integrating the fields of astronomy, weather, climate, oceanography, physical and historical geology in preparation for secondary school teaching of modern earth science curricula.
- 5-020. ENVIRONMENTAL GEOLOGY OF MINNESOTA.** (5 cr; prereq 1-110 or #; not usable toward Master's degree in geology; offered summer only) Darby, Ojakangas
Rocks, minerals, waters, land forms, geological history, and mineral resources—both developed and potential—of Minnesota. Technical, economic, and cultural aspects of the use and preservation of Minnesota's natural resources will be stressed. Laboratory includes a number of local field trips and one 2-day field trip to emphasize the geological history of Minnesota and the significance of geology in land use, development, and environmental problems.
- 5-100. FIELD GEOLOGY.** (9 cr or ar; prereq 3-100 and 3-312; summers only, at Wasatch-Uinta Field Camp in Utah; 6 wks)
Measurement of stratigraphic sections; field study of fossils and igneous, sedimentary, and metamorphic rocks. Geological mapping on aerial photographs and topographic maps. Preparation of geologic maps and cross sections. Study of structural and geomorphic features and geologic setting of mineral deposits.
- 5-142. SEDIMENTATION AND STRATIGRAPHY.** (4 cr; prereq 3-312 or #; 3 hrs lect, 2 hrs lab) Darby, Ojakangas

Section 2—Major-Minor Requirements and Courses

Principles and procedures in the study of sedimentary rocks; mechanics and environments of deposition; stratigraphic nomenclature; history of stratigraphy. Laboratory includes study of analytical techniques for sediments, construction of subsurface maps, and interpretation of well logs and geologic maps.

- 5-150. PRECAMBRIAN GEOLOGY.** (4 cr; prereq 3-510 and ♯; 3 hrs lect, 1 wk pre-qr field trip; offered 1972-73 and alt yrs)
Nature, distribution, origin, correlation, and special problems of the Precambrian with emphasis in the Lake Superior region. Term paper.
- 5-180. SEMINAR: PRECAMBRIAN GEOLOGY.** (1-3 cr [may be repeated for a maximum of 6 cr]; prereq 5-150)
- 5-181. SEMINAR: STRATIGRAPHY-SEDIMENTATION.** (1-2 cr [may be repeated for a maximum of 4 cr]; prereq ♯) Darby, Ojakangas
- 5-190. GEOLOGIC PROBLEMS.** (1-2 cr; open only to srs and grad students; prereq ♯) Individual research in laboratory or field problems.
- 5-211. GLACIAL AND QUATERNARY GEOLOGY.** (4 cr, §5-210; prereq 1-110 or ♯; 3 hrs lect, 2 hrs field lab) Matsch
Physics of glaciers (glaciology), including their erosional and depositional activities. Survey of geological and biological responses to the changing environment resulting from climatic fluctuations during the last 3 million years of earth history. Field studies on the glacial deposits of Minnesota.
- 5-280. SEMINAR: GEOMORPHOLOGY-GLACIAL.** (2 cr; prereq 3-200 and 5-211 or ♯) Matsch
Selected topics in geomorphology, glaciology, and the Quaternary geology of North America, with special emphasis given to the quantitative aspects of recent research in these fields.
- 5-305. OPTICAL MINERALOGY.** (4 cr; prereq 3-312 or ♯; 2 hrs lect, 6 hrs lab) Green
Study and identification of crystalline substances using the polarizing microscope and both thin sections and immersion media; introduction to opaque microscopy.
- 5-311. ANALYTICAL TECHNIQUES FOR GEOLOGY.** (4 cr; prereq Chem 1-112, Phys 1-031, Math 1-286 or ♯; 2 hrs lect, 4 hrs lab) Davidson
Basic concepts in modern crystallography. Theory and technique of various analytical procedures including: x-ray diffraction and fluorescence, atomic absorption, electron microprobe, electron microscope, and mass spectrometry.
- 5-320. INTRODUCTION TO THEORETICAL PETROLOGY.** (3 cr; prereq Math 1-286, Chem 1-112 or Chem 1-121; 3 hrs lect) Grant
Basic topics in theoretical petrology, in particular phase equilibria as applied to geologic systems.
- 5-330. PETROLOGY OF IGNEOUS ROCKS.** (4 cr; prereq 3-312, 5-305 and 5-320 and ♯; 2 hrs lect, 4 hrs lab) Green
Survey of important igneous rock types; physical chemistry of magmatic systems; genesis and differentiation of magmas; problems in theoretical igneous petrology; laboratory study of volcanic and plutonic rock associations. Term paper.
- 5-340. PETROLOGY OF METAMORPHIC ROCKS.** (4 cr; prereq 3-312, 5-305 and 5-320 and ♯; 2 hrs lect, 4 hrs lab) Grant
Metamorphic processes and products including interpretation from theory and experiment; problems in metamorphic petrogenesis; laboratory study with the petrographic microscope and other techniques. Term paper.
- 5-350. PETROLOGY OF SEDIMENTARY ROCKS.** (4 cr; prereq 3-312, 5-305 and ♯; 2 hrs lect, 4 hrs lab) Ojakangas
Provenance, associations, and classifications of sedimentary rocks, including sandstones, carbonates, muddy rocks, and others. Microscopic study of thin sections and grain mounts; statistical techniques. Interpretation of rock suites. Term paper.
- 5-380. SEMINAR: CRYSTAL CHEMISTRY.** (2 cr; prereq Math 1-286, Chem 1-112 and ♯; offered when feasible) Davidson
The study of chemical bonding, atomic structures, crystal growth, crystal chemistry, and crystal properties.
- 5-400. INTRODUCTORY GEOCHEMISTRY.** (3 cr; prereq 1-110, Chem 1-112, Math 1-286 or ♯; offered 1972-73 and alt yrs) Grant
Origin, abundance, and distribution of elements in the solar system, with emphasis on the earth. Fundamentals of phase equilibria and the elementary application of thermodynamics to geologic systems are treated. The fundamentals of isotope geochemistry and its applications to geology are considered.

- 5-510. ADVANCED STRUCTURAL ANALYSIS.** (4 cr; prereq 3-511, Phys 1-031, Math 1-287, Math 3-501 or #; offered 1973-74 and alt yrs) Davidson
The theory of rock deformation, stress-strain theory applications; computerized model and tectonite analysis.
- 5-581. SEMINAR: GEOTECTONICS.** (2 cr, §5-580; prereq 3-511 or #) Davidson
The study of the distribution, origin, and geophysical parameters of major earth structures as related to the new global tectonics.
- 5-610. ORE DEPOSITS.** (4 cr; prereq 3-511, Chem 1-112, Math 1-185 or #; 3 hrs lect, 2 hrs lab; offered 1972-73 and alt yrs) Davidson, Marsden
The distribution, nature, tectonic setting, and origin of ore deposits.
- 5-611. GEOLOGY OF IRON ORES.** (2 cr; prereq 5-610 or #; offered when feasible) Marsden
Nature, distribution, and origin of iron ores, stressing Precambrian iron ores. Term paper.
- 5-620. INDUSTRIAL MINERALS AND FUELS.** (3 cr; prereq 3-511 or #; offered 1973-74 and alt yrs) Marsden
Origin, distribution, and nature of industrial mineral deposits, petroleum, and coal.
- 5-630. ECONOMIC ASPECTS OF GEOLOGY.** (2 cr; prereq 3-600 or #) Marsden
Political, economic, and environmental factors influencing the mineral industries. Term paper.
- 5-700. PALEONTOLOGY.** (5 cr, §3-700; prereq 1-110 or #; 3 hrs lect, 4 hrs lab) Darby
Study of invertebrate animals as fossils. The morphology, taxonomy, and ecology of important micro and macro invertebrate fossil groups; comparison of living and extinct forms; stratigraphic occurrences; geological time ranges; index fossils of North America.
- 8-180. SEMINAR.** (1 cr)
Oral and written presentations on topics of current significance to geoscientists. Participation by department staff.
- 8-190. GEOLOGIC RESEARCH.** (Cr ar; prereq #)

GERMAN (Ger)

(Language Department)

Advisers—Associate Professors O'Brien, Viksna; Instructor Gorshkow

MAJOR IN GERMAN FOR THE B.A. DEGREE

Ger 1-101/1-102/1-103—Beginning German (15)	examination or documentation from another institution
Ger 1-201/1-202/1-203—Intermediate German (9)	Plus 28 credit hours of Upper Division courses in German; up to 8 credits may be from other departments directly relevant to the student's program
Ger 3-121/3-122/3-123—Advanced German (12)	
(or) A language competence equivalent to Ger 3-123, which may be determined by	Total (64)

A student majoring in German must pass an oral proficiency examination which should be taken while the student is enrolled in the "Advanced German" sequence; the examination may be repeated.

MINOR IN GERMAN FOR THE B.A. DEGREE

Ger 1-101/1-102/1-103—Beginning German (15)	(or) A language competence equivalent to Ger 3-123 which may be determined by examination or documentation from another institution
Ger 1-201/1-202/1-203—Intermediate German (9)	Plus 8 credit hours of Upper Division courses in German
Ger 3-121/3-122/3-123—Advanced German (12)	
	Total (44)

MAJOR IN GERMAN FOR THE B.S. DEGREE

Required for students intending to seek teacher certification.

Ger 1-101/1-102/1-103—Beginning
German (15)

Ger 1-201/1-202/1-203—Intermediate
German (9)

Ger 3-121/3-122/3-123—Advanced
German (12)

(or) A language competence equivalent to
Ger 3-123, which may be determined by
examination or documentation from
another institution

Lang 3-801—Teaching Nonnative Language (4)

A phonetics or linguistics course, such as
SPA 1-990, Introduction to Phonetics
(4); Engl 5-811, Introduction to Modern
English (4); Span 3-152, Phonology,
Morphology and Syntax (4)

Plus 20 credit hours of Upper Division
courses in German; a maximum of 5
credits may be from other departments
directly relevant to the student's program

Total (64)

A student majoring in German must pass an oral proficiency examination which should be taken while the student is enrolled in the "Advanced German" sequence; the examination may be repeated. The B.S. candidate must pass the examination before being permitted to student teach. All German B.S. majors must student teach in German for certification.

MINOR IN GERMAN FOR THE B.S. DEGREE

Required for students intending to seek teacher certification.

Ger 1-101/1-102/1-103—Beginning
German (15)

Ger 1-201/1-202/1-203—Intermediate
German (9)

Ger 3-121/3-122/3-123—Advanced
German (12)

(or) A language competence equivalent to
Ger 3-123, which may be determined by
examination or documentation from
another institution

Lang 3-801—Teaching Nonnative Language (4)

A phonetics or linguistics course, such as
SPA 1-990, Introduction to Phonetics
(4); Engl 5-811, Introduction to Modern
English (4); Span 3-152, Phonology,
Morphology and Syntax (4)

Total (44)

A student taking a B.S. minor in German must pass an oral proficiency examination which should be taken while the student is enrolled in the "Advanced German" sequence; the examination may be repeated. The candidate must pass the examination before being permitted to student teach. All German B.S. minors must student teach in German for certification.

COURSES

1-101/1-102/1-103. BEGINNING GERMAN. (5 cr each)

Grammar; reading; conversation.

1-111/1-112. BEGINNING GERMAN. (8 cr first term, 7 cr second term; offered summer only)

Grammar; reading; conversation. Covers the same material handled in the regular first-year sequence.

1-201/1-202/1-203. INTERMEDIATE GERMAN. (3 cr each; prereq 1-103)

Review of grammar. Improvement of proficiency in language skills.

1-211/1-212. INTERMEDIATE GERMAN. (5 cr first term, 4 cr second term; offered summer only)

Review of grammar. Improvement of proficiency skills. Covers the same material handled in the regular intermediate sequence.

3-121/3-122/3-123. ADVANCED GERMAN. (4 cr each, §3-101/3-102/3-103; prereq 1-203)

Composition; conversation; grammar; reading.

3-171. READINGS IN SCIENTIFIC GERMAN. (5 cr; prereq 1-102, jr; offered when feasible)

Readings in the physical and natural sciences.

- 3-304. **DEUTSCHE KULTURKUNDE.** (4 cr, §3-301, §3-302; prereq 1-203; offered 1972-73 and alt yrs)
Civilization and culture of the German speaking countries until 1945.
- 3-305. **DEUTSCHLAND HEUTE.** (4 cr, §3-303; prereq 1-203; offered 1972-73 and alt yrs)
Civilization and culture of the German speaking countries since 1945.
- 3-505. **GERMAN POETRY.** (4 cr, §3-501; prereq 1-203; offered 1973-74 and alt yrs)
- 3-506. **GERMAN DRAMA.** (4 cr, §3-502; prereq 1-203; offered 1972-73 and alt yrs)
Selected dramas from the classical period to the present.
- 3-511. **LITERATURE IN TRANSLATION.** (4 cr, §3-510; students may substitute Engl 3-511, Fr 3-511, or Span 3-511 for Ger 3-511 in selecting electives)
Reading of German literature in translation.
- 3-542. **GERMAN CLASSICISM.** (4 cr, §3-541; prereq 1-203; offered 1973-74 and alt yrs)
- 3-553. **THE GERMAN ROMANTICS.** (4 cr, §3-552; prereq 1-203; offered 1973-74 and alt yrs)
Representative authors of the Romantic period.
- 3-554. **THE GERMAN NOVELLE.** (4 cr, §3-551; prereq 1-203; offered 1973-74 and alt yrs)
- 3-573. **20TH-CENTURY LITERATURE.** (4 cr, §3-572; prereq 1-203; offered when feasible)
Representative authors of the 20th century.
- 3-997. **SEMINAR.** (4 cr per qtr [may be repeated for a maximum of 8 cr], §3-998; prereq 1-203 and §)
prereq 1-203 and §)
- 5-542. **GOETHE IN TRANSLATION.** (4 cr, §5-541; offered 1972-73 and alt yrs) Viksna
Reading and analysis of Goethe's major works. Poems from early and middle periods, *The Sufferings of Young Werther*, *Faust* or *Elective Affinities* depending on the student's preparation.
- 5-574. **LITERATURE SINCE 1945.** (4 cr, §3-571; offered 1973-74 and alt yrs) O'Brien
Reading and analysis of German literature since 1945 with emphasis on the novel. Knowledge of German not required.
- Lang 3-801. **TEACHING NONNATIVE LANGUAGE.** (4 cr; prereq 24 cr of German or §)
The theory and practice of teaching basic nonnative language skills and cultural concepts at any educational level. Applicable also to teachers of English as a foreign language.

HEALTH EDUCATION** (Hlth)

(Physical Education Department)

Adviser—Professor Rickert

MINOR IN SCHOOL HEALTH EDUCATION FOR THE B.S. DEGREE

The minor in school health education is designed to help provide the prospective teacher with information on health needs of the child, the home, the school, and community, and to point the way to instructional and service aspects of these needs. The minor is open to men and women.

REQUIRED COURSES

Biol 1-041

HE 1-330

Hlth 1-500, 3-101, 3-102, 3-320, 3-321

Ind 3-950

Psy 3-311 or 3-321, 3-531

Total (29)

** Includes School Health Education.

COURSES

- 1-101. PERSONAL HEALTH.** (2 cr)
Normal body functioning; factors and conditions that affect the health and efficiency of the individual and family.
- 1-102. HEALTH CARE OF THE FAMILY.** (2 cr)
Procedures and techniques applicable to care of the sick in the home; meets requirement for Red Cross Nursing Certification.
- 1-500. FIRST AID AND SAFETY.** (1 cr)
Principles of first aid and accident prevention in the home and community; leads to the American Red Cross Standard First Aid Certificate.
- 3-101. PERSONAL AND COMMUNITY HEALTH.** (3 cr)
Personal hygiene in relation to the community; community programs for the control of communicable diseases.
- 3-102. SUPERVISION OF STAFF.** (2 cr; prereq 3-320 and 3-321 and #)
Coordination of staff and available resources for school health education.
- 3-320. METHODS AND MATERIALS.** (3 cr; prereq 1-101 or 3-101)
Scope of the field; curricular suggestions on elementary and secondary levels; method and materials for teaching; steps in unit planning; evaluation of program.
- 3-321. PRINCIPLES.** (3 cr; prereq 1-101 or 3-101)
Basic principles and functions of the school health program; instruction service; healthful school living; place of the health program in the school and its relationship to outside agencies.
- 5-140. ADMINISTRATION OF THE PROGRAM.** (3 cr; prereq 1-101 or 3-101 and #)
Health education in public elementary and secondary schools; special reference to curriculum construction, health supervision, and guidance; relationships between public schools and governmental health organizations and agencies; evaluation; assistance in solution of individual professional problems.
- 5-300. ADVANCED INSTRUCTION—SECONDARY.** (3 cr; prereq #)
Instructional and individual problems.

HISTORY (Hist)

Advisers—Professors Lindquist, Livingston, Maclear; Associate Professors Fischer, Morris; Assistant Professors Huch, Storch; Instructors Rich, Thompson

See Section 4 for master of arts degree program in history.

Honors Program—For history majors with a grade point average of 3.40 in all history courses and 3.25 overall. Required senior paper must merit honors designation by the department. Three-part (6-hour) comprehensive honors essay examination, written at least 6 weeks before graduation, must merit departmental honors. See department head for further details.

MAJOR IN HISTORY FOR THE B.A. AND B.S. DEGREES

Required for students intending to seek teacher certification.

Two of the following sequences (22 or 24):

Hist 1-054, 1-055, 1-056—Ancient Civilization (12)

Hist 1-154, 1-155—English History (10)

Hist 1-204, 1-205, 1-206—Civilization of the Modern World (12)

Hist 1-301, 1-302, 1-303—American History (12)

Hist 3-002—Historical Research (4) (required for all majors during junior year)

Additional electives in history courses numbered 3-000 or above, including at least one sequence of 8 or more credits in American history and at least one sequence of 8 or more credits in European history (23 or 25)

Total (51)

Senior Paper Requirement—The writing of an acceptable senior paper in the field of history is part of the history major. Following completion of the junior year the student shall, with the approval of a member of the department (who thereupon agrees to act as project adviser), select a research project appropriate to a senior paper. He may pursue his investigation by enrolling in Hist 3-011. By the end of the third week of the student's final undergraduate quarter the completed senior paper in final form must be submitted to the project adviser. The paper shall be judged by the adviser and one other faculty member selected by the student, whose area of competence shall have some logical relation to the subject of the paper.

With the permission of the major adviser, a student majoring in history may in some cases substitute 3-000 level courses in the same field for part of the Lower Division requirement. The granting of such permission will depend upon high school preparation and performance in previous college work. History courses at the 3-000 level may not be taken during the freshman year, and can be taken during the sophomore year only with the consent of the instructor.

It is not the policy of the department to set rigid requirements for supporting courses from outside the major. However, it strongly recommends the study of a foreign language, especially by students who are considering graduate work in history. It also strongly recommends that history majors discuss with their major advisers the selection of elective courses from other areas, as an aid in the development of a coherent program.

MINOR IN HISTORY FOR THE B.A. AND B.S. DEGREES

Required for students intending to seek teacher certification.

One of the following sequences (10 or 12):
 Hist 1-154, 1-155—English History (10)
 Hist 1-204, 1-205, 1-206—Civilization of
 the Modern World (12)
 Hist 1-301, 1-302, 1-303—American His-
 tory (12)

Electives in history courses numbered 3-000
 or above, including at least 8 credits in
 American history and 8 credits in Euro-
 pean history. Students majoring in Eng-
 lish for the B.S. degree may substitute
 Hist 1-154, 1-155 for part of this re-
 quirement (18 or 20)

Total (30)

Minors in the B.S. degree program must do student teaching in history to receive certification in history.

COURSES

- 1-054, 1-055, 1-056. ANCIENT CIVILIZATION.** (4 cr each, §1-051 for 1-054, §1-052 for 1-055, §1-053 for 1-056)
 1-054: The Tigris-Euphrates civilization; Egypt; Assyria; the Persian Empire. 1-055: Early Cretan civilization; Prehistoric Greece and Greek civilization during the 5th century; Alexander the Great. 1-056: The Etruscans and early Rome; Roman Republic; the Roman Empire to A.D. 476.
- 1-154, 1-155. ENGLISH HISTORY.** (5 cr each, §1-151 and §1-152 for 1-154, §1-152 and §1-153 for 1-155)
 1-154: Medieval and Renaissance England to 1603. 1-155: Modern Britain and British Empire.
- 1-204, 1-205, 1-206. CIVILIZATION OF THE MODERN WORLD.** (4 cr each, §1-201 for 1-204, §1-202 for 1-205, §1-203 for 1-206)
 1-204: Rise of modern state system in Europe and the economic, intellectual, and religious implications of the emerging system. 1-205: State system in action, 1713-1871; end of the old regime and creation of the liberal democratic compromise. 1-206: Impact of industrialism; end of the 19th-century peace and decline of liberal democracy in the 20th century.

Section 2—Major-Minor Requirements and Courses

- 1-301, 1-302, 1-303. AMERICAN HISTORY.** (4 cr each)
Political, economic, and social history of the United States. 1-301: Colonial, Revolutionary, and Early Republic to 1815. 1-302: National development from 1815-1900. 1-303: Since 1900.
- 1-366. AFRO-AMERICAN HISTORY.** (5 cr, §1-364, §1-365)
Survey of the experience of Afro-Americans in the United States.
- 3-002. HISTORICAL RESEARCH.** (4 cr, §3-001; required for majors in jr yr)
Laboratory course in historical method.
- 3-011. INDEPENDENT STUDY.** (3 cr; prereq 18 cr in history, by invitation and Δ)
Involves independent study and research in the field of student's major interest in history.
- 3-164, 3-165. ENGLISH CONSTITUTIONAL HISTORY.** (4 cr each, §3-161 and §3-162 for 3-164, §3-162 and §3-163 for 3-165; prereq 1-154 or 1-155 or #; offered 1972-73 and alt yrs)
3-164: Beginnings and growth of English government and law. 3-165: Emergence of modern government, the English revolutions, democracy.
- 3-216, 3-217. THE EUROPEAN REVOLUTIONS 1774-1871.** (4 cr each, §3-214 for 3-216, §3-215 for 3-217; offered 1973-74 and alt yrs)
3-216: French Revolution, Napoleon, development of 19th-century liberalism and nationalism. 3-217: Nationalism and revolution, rise of Germany, socialism, transformation of European culture.
- 3-233. MODERN FRANCE.** (5 cr, §3-231, §3-232)
History of France from 1814 to present.
- 3-264, 3-265. HISTORY OF RUSSIA.** (4 cr each, §3-261 and §3-262 for 3-264, §3-262 and §3-263 for 3-265; prereq 1-204, 1-205, 1-206 or #)
3-264: Kiev to Alexander III. 3-265: Alexander III to present.
- 3-280. CHURCH AND STATE IN MODERN EUROPE.** (3 cr; offered when feasible)
Principal movements in the history of church and state since the French Revolution.
- 3-314, 3-315. 19TH-CENTURY AMERICA.** (4 cr each, §3-311 and §3-312 for 3-314, §3-312 and §3-313 for 3-315)
3-314: Early national period, Jacksonian Era, development of sectional controversy to 1860. 3-315: Civil War, Reconstruction, late 19th century.
- 3-324, 3-325. 20TH-CENTURY AMERICA.** (5 cr each, §3-321 and §3-322 for 3-324, §3-322 and §3-323 for 3-325)
3-324: Late 19th century to 1933. 3-325: 1933 to present.
- 3-354, 3-355, 3-356. AMERICAN ECONOMIC AND SOCIAL HISTORY.** (4 cr each, §3-351 for 3-354, §3-352 for 3-355, §3-353 for 3-356; offered 1972-73 and alt yrs)
3-354: Colonial life. 3-355: From the Revolution to 1860. 3-356: Developments since 1860.
- 3-374, 3-375. GROWTH OF AMERICAN THOUGHT.** (4 cr each, §3-371 and §3-372 for 3-374, §3-372 and §3-373 for 3-375; offered 1972-73 and alt yrs)
3-374: From Puritanism to the anti-slavery crusade. 3-375: From Darwinism to 20th-century thought.
- 3-404, 3-405. HISTORY OF LATIN AMERICA.** (5 cr each, §3-401 and §3-402 for 3-404, §3-402 and §3-403 for 3-405)
3-404: Latin America during the colonial period to mid-19th century. 3-405: Latin America from mid-19th century to present.
- 3-457, 3-458. FAR EAST.** (5 cr each, §3-454 and §3-455 for 3-457, §3-455 and §3-456 for 3-458)
3-457: Ancient times to 1842. 3-458: 1842 to present.
- 5-001/5-002/5-003. DIRECTED STUDY.** (3 cr each; prereq #)
A proseminar course.
- 5-124, 5-125, 5-126. RENAISSANCE AND REFORMATION.** (4 cr each, §5-121 for 5-124, §5-122 for 5-125, §5-123 for 5-126; prereq 1-204, 1-205, 1-206 or #; offered 1973-74 and alt yrs) Maclear
5-124: The Renaissance. 5-125: The Northern Renaissance and Reformation to 1530. 5-126: The Reformation after 1530.
- 5-225, 5-226, 5-227. RECENT EUROPE.** (4 cr each, §5-221 and §5-222 for 5-225, §5-222 and §5-223 for 5-226, §5-223 and §5-224 for 5-227; prereq 1-204, 1-205, 1-206 or #) Morris

- 5-225: Effect of industrialism, liberalism, imperialism, and nationalism on European nation states from 1870 to 1905. 5-226: Background and significance of World War I. 5-227: The interwar years; World War II to present.
- 5-376, 5-377. **THE AMERICAN SOUTH.** (4 cr each, §5-374 for 5-376, §5-375 for 5-377; prereq 1-301, 1-302, 1-303) Fischer
5-376: To 1877. 5-377: To the present.
- 5-384, 5-385. **AMERICAN FOREIGN RELATIONS.** (4 cr each, §5-381 and §5-382 for 5-384, §5-382 and §5-383 for 5-385; prereq 1-301, 1-302, 1-303) Livingston, Storch
5-384: Revolution to 1898. 5-385: From 1898 to present.
- 5-811/5-812/5-813†. **PROSEMINAR: 19TH-CENTURY AMERICA.** (3 cr each; prereq #) Fischer
5-811: The development of American nationality, 1789-1824. 5-812: Jacksonian democracy and manifest destiny. 5-813: Civil War and Reconstruction, 1860-1880.
- 5-821/5-822/5-823†. **PROSEMINAR: 20TH-CENTURY AMERICA.** (3 cr each; prereq #) Livingston
5-821: Late 19th century to 1917. 5-822: From 1917 to 1938. 5-823: From 1938 to the present.
- 5-891, 5-892, 5-893. **MINNESOTA AND THE NORTHWEST.** (4 cr each, §5-391 for 5-891, §5-392 for 5-892, §5-393 for 5-893; prereq 1-301, 1-302, 1-303 or #; offered 1973-74 and alt yrs) Lindquist
5-891: Exploration, settlement, and development to 1849. 5-892: Territorial commonwealth and early statehood to 1870. 5-893: Development to the present.
- 5-894, 5-895, 5-896. **THE AMERICAN WEST.** (4 cr each, §5-394 for 5-894, §5-395 for 5-895, §5-396 for 5-896; prereq 1-301, 1-302, 1-303 or #) Lindquist
5-894: The Old West. 5-895: The Trans-Mississippi West and the Great Plains. 5-896: The Far West.
- 8-001. **HISTORICAL BIBLIOGRAPHY AND CRITICISM.** (3 cr; required of candidates for the M.A. degree in history who do not present evidence of similar training elsewhere) Storch
- 8-891/8-892/8-893†. **SEMINAR: MINNESOTA AND THE NORTHWEST.** (3 cr each; prereq #) Lindquist
8-891: Explorations to 1849. 8-892: Territorial and early statehood to 1873. 8-893: Since 1873.

HOME ECONOMICS (HE)

Advisers—Associate Professor Schulz; Assistant Professor E. Collins; Instructors Bannett, Eaton, Juntunen

The Department of Home Economics has as its primary purpose the preparation of its students for professional careers and service which relate to the improvement of individual, family, and community life. The program is focused on assisting individuals and families with problems of human welfare that are of compelling significance in a contemporary changing society.

The Department of Home Economics offers a choice of two degrees (a) the B.S. degree for those planning to enter the teaching profession or extension service; satisfactory completion of the curriculum for the B.S. degree qualifies the graduate to teach consumer and homemaking programs in secondary schools which meet the requirements of the State Plan of the Minnesota State Board for Vocational Education; (b) the B.A. degree for students preparing for careers in business, health, and welfare.

Variations in the program appropriate to individual interests or career goals are available through departmental advisement in the choice of major electives and in courses chosen from other fields which support the home economics major.

Section 2—Major-Minor Requirements and Courses

Home economics majors are urged to utilize vacations for experience in some field related to the major, such as merchandising, health and welfare service, camp counseling, food service in camps, restaurants, or hospitals.

MAJOR IN HOME ECONOMICS FOR THE B.A. DEGREE

HOME ECONOMICS COURSES

- HE 1-005/1-010—Clothing I and II (8)
- HE 1-250/1-260—Family and Child Development I and II (8)
- HE 1-330—Introduction to Nutrition (3)
- HE 1-730—Food Preparation (5)
- HE 1-810/1-820—The Home and Its Environment I and II (8)
- HE 3-835—Home Management (5)
- Electives in home economics courses numbered 3-000 or above (20)

Total (57)

SUPPORTING COURSES REQUIRED

- Art 1-001—Art Today (4)
- Art 1-002—Introduction to Art (4)
- Chem 1-103/1-104—General Chemistry (10)
- (or) Chem 1-110/1-111—General Chemistry (10)
- Chem 1-500—Organic Chemistry (5)
- Econ 1-004—Principles of Economics: Micro (4)
- Psy 1-003—General Psychology (5)
- Soc 1-100—Problems of American Society (5)
- (or) Soc 1-400—Social Inquiry I (5)

Total (37)

MINOR IN HOME ECONOMICS FOR THE B.A. DEGREE

- HE 1-005—Clothing I (4)
- HE 1-250—Family and Child Development I (4)
- HE 1-330—Introduction to Nutrition (3)
- HE 1-730—Food Preparation (5)
- (or) HE 1-761—Introduction to Foods (3)

- HE 1-810—The Home and Its Environment I (4)
- Electives in home economics including 6 credits in courses numbered 3-000 or above (10)

Total (28-30)

MAJOR IN HOME ECONOMICS FOR THE B.S. DEGREE

Recommended for students intending to seek teacher certification.

FRESHMAN-SOPHOMORE PROGRAM

- HE 1-005/1-010—Clothing I and II (8)
- HE 1-250/1-260—Family and Child Development I and II (8)
- HE 1-330—Introduction to Nutrition (3)
- HE 1-730—Food Preparation (5)
- HE 1-810/1-820—The Home and Its Environment I and II (8)

Subtotal (32)

- HE 5-568—Housing Problems of the Family (3)
- HEED 5-100—Workshop: (Various Titles To Be Assigned) (1 to 4)
- HEED 5-320—Adult Education in Home Economics (3)

Subtotal (32)

Total for Major (64)

JUNIOR-SENIOR PROGRAM

- HE 3-160—Textile Fabrics (4)
- HE 3-432—Trends in Foods (3)
- HE 3-510—Community Housing (3)
- HE 3-650—Family Relationships (3)
- HE 3-835—Home Management (5)
- HE 3-861—Home Economics Methods (5)
- 9 credits in home economics selected from the following electives:
 - HE 3-005—Family Clothing (3)
 - HE 3-015—Clothing Design and Construction (3)
 - HE 3-402—Meal Management (4)
 - HE 3-412—Family Nutrition (3)
 - HE 3-422—Quantity Food Service (3)
 - HE 3-880—Home Economics Seminar (1)
 - HE 3-910—Special Problems in Home Economics (3)

SUPPORTING COURSES REQUIRED

- Art 1-001—Art Today (4)
- Art 1-002—Introduction to Art (4)
- Biol 1-001—Elements of Microbiology (4)
- Chem 1-103/1-104—General Chemistry (10)
- (or) Chem 1-110/1-111—General Chemistry (10)
- Chem 1-500—Organic Chemistry (5)
- Econ 1-004—Principles of Economics: Micro (4)
- Econ 5-003—Consumer Economics (4)
- Ind 5-928—Philosophy and Practices of Vocational Education (3)
- Psy 1-003—General Psychology (5)
- Soc 1-100—Problems of American Society (5)
- (or) Soc 1-400—Social Inquiry I (5)

Total (48)

COURSES

- 1-005/1-010. CLOTHING I AND II.** (4 cr each, §1-003, §1-004; 2 hrs lect, 4 hrs lab)
Clothing design; shaping materials to the individual figure; selection, alteration, and care of ready-to-wear.
- 1-250/1-260. FAMILY AND CHILD DEVELOPMENT I AND II.** (4 cr each, §1-660; prereq Psy 1-003, Soc 1-100 or Soc 1-400; 3 hrs lect, 2 hrs observ)
Emotional, intellectual, physical, and social development of husband and wife throughout the family cycle and of children through preschool. Family interactions. Values, attitudes, and behaviors of families at different socio-economic levels.
- 1-330. INTRODUCTION TO NUTRITION.** (3 cr)
Fundamental principles of nutrition applied to everyday living problems of the young adult.
- 1-730. FOOD PREPARATION.** (5 cr; prereq 1-330 or §1-330 and Chem 1-104, Chem 1-500 or §Chem 1-500)
Scientific principles applied to the technical and manipulative aspects of food preparation; evaluation of food products.
- 1-761. INTRODUCTION TO FOODS.** (3 cr; for men and women nonmajors only; 1 hr lect, 4 hrs lab)
Fundamental principles and practices in food preparation and selection; planning, preparing, and serving simple meals.
- 1-810/1-820. THE HOME AND ITS ENVIRONMENT I AND II.** (4 cr each, §3-480; prereq Art 1-001, Art 1-002 or Art 1-011; 2 hrs lect, 4 hrs lab)
Physical, aesthetic, social, and economic factors affecting the choice of a home and its furnishings.
- 3-005. FAMILY CLOTHING.** (3 cr; prereq 1-010 or §; 2 hrs lect, 2 hrs lab)
Clothing plan for a family; production, consumption, and economics of clothing; recent developments in choice of clothing for specific uses.
- 3-015. CLOTHING DESIGN AND CONSTRUCTION.** (3 cr; prereq 1-010 or §; 6 hrs lect-lab-dem)
Advanced clothing construction projects, factors influencing construction, evaluation of techniques and products.
- 3-160. TEXTILE FABRICS.** (4 cr; prereq Chem 1-500; 3 hrs lect, 2 hrs lab)
Physical and chemical properties of fibers, yarns, fabrics, and finishes; their effects on performance of textiles; care and maintenance requirements.
- 3-402. MEAL MANAGEMENT.** (4 cr; prereq 1-730, Biol 1-001 or §; 1 hr lect, 6 hrs lab)
Planning, preparation, and service of meals; emphasis on management of money, time, energy, and aesthetic aspects. Legislation relating to protection of the food consumer.
- 3-412. FAMILY NUTRITION.** (3 cr; prereq 1-330, Chem 1-500 and Biol 1-041 or Biol 1-102 or §)
Nutritional needs of the family; chemical aspects of specific nutrients as related to selection of food for the family group of all ages.
- 3-422. QUANTITY FOOD SERVICE.** (3 cr; prereq 1-761 or §; 1 hr lect, 4 hrs lab; offered when feasible)
Factors involved in food service for groups of 50 and over; menu planning, quantity buying, management procedures.
- 3-432. TRENDS IN FOODS.** (3 cr; prereq 3rd qtr soph, 1-730; 2 hrs lect, 2 hrs lab)
Comparative use and cost of convenience foods; survey of the literature; class projects with emphasis on recent technological developments.
- 3-510. COMMUNITY HOUSING.** (3 cr, §3-480; prereq Soc 1-100 or Soc 1-400; 2 hrs lect, 2 hrs lab)
Historic, economic, sociological, and psychological aspects of housing; government involvement in housing.
- 3-650. FAMILY RELATIONSHIPS.** (3 cr; prereq Soc 1-100 or Soc 1-400, jr)
Social, economic, and psychological aspects of home living; their contribution to a satisfying and well-managed home life.
- 3-835. HOME MANAGEMENT.** (5 cr; prereq sr majors or §)
Procedures and problems encountered in management of a home; supervised field work with families.
- 3-861. HOME ECONOMICS METHODS.** (5 cr; prereq requirements for application to student tchg completed)

Section 2—Major-Minor Requirements and Courses

Organization and administration of homemaking programs at the secondary level, including curriculum development, techniques of teaching, teaching materials, evaluation, and observations.

3-880. HOME ECONOMICS SEMINAR. (1 cr; prereq sr)

Assigned topics with special reference to current home economics problems.

3-910. SPECIAL PROBLEMS IN HOME ECONOMICS. (3 cr; prereq jr)

Opportunity for students to develop further study in some phase of home economics.

5-568. HOUSING PROBLEMS OF THE FAMILY. (3 cr; prereq sr, Soc 1-100 or Soc 1-400, Econ 1-004 or #; offered when feasible)

Problems of urban and rural homes; evaluation of economic, art, and social aspects. Discussions, field trips, and classroom analyses.

HEED 5-100. WORKSHOP: (Various Titles To Be Assigned). (1 to 4 cr each offering; prereq tchg exper or #)

Opportunities for in-service teachers to concentrate study on new materials and curriculum problems in various aspects of home economics.

HEED 5-300. HOME ECONOMICS CURRICULUM. (3 cr; prereq HE 3-861, tchg exper or #; offered when feasible)

Examination of research and literature; development of units of study and programs at the elementary and secondary level; production and evaluation of materials.

HEED 5-320. ADULT EDUCATION IN HOME ECONOMICS. (3 cr; prereq sr, HE 3-861, SeEd 3-503 or #)

Adult education in homemaking; problems affecting community and family life; methods and techniques in helping adults and out-of-school youths solve problems in home living; for teachers, extension workers, and other workers in adult education.

HONORS SEMINARS (HSem)

Information regarding current offerings and topics in Honors Seminars may be procured from the office of the Vice Provost for Academic Administration. Topics for study are normally interdisciplinary and deal with material seldom examined elsewhere in the University. Credit given in each seminar is applicable to one or more specified categories of the liberal education requirement. Admission to Honors Seminars is limited and restricted to exceptionally able students. Honors Seminars may be taken on the P-N system.

COURSES

1-100. HONORS SEMINAR I. (3 cr [may be repeated for a maximum of 9 cr]; prereq fr and selection by Honors Committee; offered when feasible)

1-500. HONORS SEMINAR II. (3 cr [may be repeated for a maximum of 9 cr]; prereq soph and selection by Honors Committee; offered when feasible)

HUMANITIES (Hum)

Adviser—Associate Professor Schroeder

MINOR IN HUMANITIES FOR THE B.A. AND B.S. DEGREES

The primary purposes of the humanities minor are to acquaint the student with a wide variety of expressions of the human mind and spirit as they appear in the arts, literary sources, and historical documents; to aid the student in developing skills for the analysis of such human expressions; and to

provide the student with experiences in crossing disciplines and combining expressive arts to investigate some of the basic concerns of mankind. Students who anticipate teaching humanities courses should register for Hum 3-090.

REQUIRED COURSES

Hum 1-001, 1-002, 1-003—Introduction to Humanism (9)

Hum 3-091—Project in the Humanities (2)

Other humanities courses (18)

Total (29)

COURSES

1-001, 1-002, 1-003. INTRODUCTION TO HUMANISM. (3 cr each)

Study of primary sources in humanism with emphasis on the Renaissance. 1-001: The rebirth of classicism. 1-002: The Renaissance man. 1-003: The man-centered universe.

1-004. UNDERSTANDING THE ARTS. (3 cr, §1-101; offered summer only)

Painting, sculpture, and architecture. Development and relationships from Egyptian period to Renaissance.

1-005. UNDERSTANDING THE ARTS. (3 cr, §1-102; offered summer only)

Painting, sculpture, and music; development and relationships from Renaissance period to 20th century.

1-006. ARTS IN THE 20TH CENTURY. (3 cr, §1-103; offered summer only)

Architecture, painting, sculpture, and music in their relationship to contemporary life.

1-007. ARTS IN AMERICA. (3 cr; offered when feasible)

Architecture, painting, sculpture, and music in the United States from the colonial period to the present.

1-021. CLASSICAL MYTHOLOGY. (4 cr, §1-017; offered when feasible)

Readings in the myths of the Greeks and the Romans, with special attention to those which have influenced Western culture.

1-022. THE BIBLE AS LITERATURE. (4 cr, §1-018)

Readings from the Old and New Testaments and the Apocrypha.

1-023. FOLKLORE. (4 cr, §1-019; offered when feasible)

Readings of fairy tales, legends, and beast fables, with special attention to the archetypal forms which have influenced Western culture.

1-031, 1-032, 1-033. AMERICAN LIFE. (3 cr each; prereq soph)

Each quarter some pervasive themes of American social and cultural life are studied in selected documents. 1-031: Colonial. 1-032: Nineteenth century. 1-033: Recent.

1-101, 1-102, 1-103. SURVEY OF THE ARTS. (4 cr each, §1-041, §1-042, §1-043; prereq soph)

Rise and development of the graphic and plastic arts, architecture, and music; influence of the sociological factors in molding the philosophy and aesthetic components. 1-101: Egyptian period through Gothic. 1-102: Renaissance period through 18th century. 1-103: The 19th and 20th centuries.

3-071, 3-072, 3-073. HUMANITIES IN THE UNITED STATES. (3 cr each)

Interdisciplinary approach to the American mind and culture through examination of works of literature, the arts, political and social documents. 3-071: Afro-American cultural heritage. 3-072: Popular culture. 3-073: The great depression and the arts.

3-090. METHODS, MATERIALS FOR HUMANITIES TEACHING. (3 cr; offered when feasible)

Humanities curriculum development; teaching methods, and preparation of teaching materials.

3-091. PROJECT IN THE HUMANITIES. (2 cr; offered every qtr, by arrangement)

An original paper or project under the guidance of the humanities minor adviser.

3-101. JAZZ STUDIES. (4 cr, §3-001)

Exploring the evolution of this art form through its foremost creators, with examination of the social problems in America which fostered its origin and shaped the development.

INDUSTRIAL EDUCATION (Ind)

Advisers—Associate Professors DeRubeis, Krejcie; Assistant Professors Alexander, Haan, Paler; Instructors Coffin, Ringsred, Voss, Watts

The Department of Industrial Education offers a choice of three curricula: (a) to prepare for teaching in the field of industrial education, (b) to prepare for teaching in vocational-technical education fields, and (c) to prepare for industrial-technical careers in industry. The bachelor of science degree with a major in industrial education embraces the generalized training necessary to teach industrial arts in junior and senior high schools. Option I of the bachelor of science degree with a comprehensive major in industrial education provides for an in-depth technical concentration and is designed for teachers of secondary industrial-vocational programs. Option II allows advanced standing credit for acquired technical competence or industrial experience and includes the required course work necessary to teach in postsecondary vocational schools. The bachelor of arts degree with a major or minor in industrial education involves training for employment in industry.

In addition to campus offerings, the department offers off-campus professional teacher education course work which is approved by the Vocational Division of the Minnesota Department of Education for certification purposes. Special courses and workshops are also available to industrial groups and personnel in need of special services.

Professional and theory courses deal with vocational philosophy, methodology, program development and evaluation, laboratory management, and industrial supervision and administration. Laboratory courses are offered in the major industrial areas and encompass current industrial practices and processes. Each student (including transfers) will be required to take some course work in theory and laboratory areas of concentration at UMD. It is strongly recommended that students majoring in industrial education, through industrial employment, gain work experience in fields related to their major.

INDUSTRIAL EDUCATION TECHNICAL CONCENTRATION BLOCKS

WOOD TECHNOLOGY

- Ind 1-101—Basic Wood Technology (5)
- Ind 1-110—Machine Woodworking (5)
- Ind 1-401—Crafts (4)
- Ind 1-441—Home Maintenance (2)
- Ind 3-113—Furniture Design, Construction (5)
- Ind 3-121—Building Construction (4)
- Ind 3-140—Wood in Industry (3)

POWER

- Ind 1-301—Power Systems (5)
- Ind 1-310—Small Gasoline Engines (2)
- Ind 1-330—Basic Aeronautics (3)
- Ind 1-353—Automotive Mechanics (4)
- Ind 3-321—Hydraulics, Pneumatics, Fluidics (5)
- Ind 3-354—Automotive Fuel and Electrical Systems (4)

DRAWING

- Ind 1-501—Basic Drawing (4)
- Ind 1-511—Technical Drawing I (4)
- Ind 1-561—Architectural Drawing I (5)
- Ind 3-512—Technical Drawing II (4)
- Ind 3-530—Industrial Design (4)
- Ind 3-565—Presentation Techniques (4)

GRAPHIC ARTS

- Ind 1-601—Introduction to Graphic Arts (5)
- Ind 1-611—Printing Layout and Design (4)
- Ind 1-620—Basic Photo Technology (3)
- Ind 1-631—Screen Process Printing (4)
- Ind 3-642—Offset Lithography (4)
- Ind 3-643—Advanced Offset Lithography (4)

METALS

- Ind 1-701—General Metals (5)
- Ind 1-710—Basic Welding (3)
- Ind 1-733—Basic Machine Tool Practice (5)
- Ind 3-702—Metal Fabrication (5)
- Ind 3-711—Combination Welding Techniques (3)
- Ind 3-734—Advanced Machine Tool Practice (5)
- Ind 3-735—NC and EDM Machining (4)

CONSTRUCTION

- Ind 1-540—American Building (3)
- Ind 1-561—Architectural Drawing I (5)
- Ind 3-121—Building Construction (4)
- Ind 3-543—Materials of Construction (4)

- Ind 3-544—Building Estimating (4)
- Ind 3-570—Introduction to Planning and Design (4)

ELECTRICITY-ELECTRONICS

- Ind 1-802—Basic AC and DC Electricity (5)
- Ind 1-803—AC and DC Electricity (5)
- Ind 3-801—AC Network Theory (5)
- Ind 3-823—Electron Tube Devices and Circuitry (5)
- Ind 3-824—Special Applications in Electronic Design (5)
- Ind 3-833—Solid State Devices (5)
- Ind 3-834—Solid State Circuitry (5)
- Ind 3-851—Digital Computer Design Fundamentals (5)
- Ind 5-890—Seminar: New Electronic Devices (3 to 6)

INDUSTRIAL EDUCATION THEORY—PROFESSIONAL

- Ind 0-900—Introduction to Industrial Education (0)
- Ind 1-910—Applied Mathematics for Technicians (4)
- Ind 3-920—Equipment and Facility Planning (2)
- Ind 3-921—Teaching Vocational Subjects (3)
- Ind 3-950—Safety Education (4)
- Ind 3-951—Industrial Practices and Processes (3)
- Ind 3-971—Training Programs in Industry (2)
- Ind 3-975—Industrial Supervision (3)
- Ind 5-922—Tests in Vocational Subjects (3)
- Ind 5-923—General Shop (3)
- Ind 5-924—Audio-Visual Materials (3)
- Ind 5-926—Coordination Techniques (3)
- Ind 5-928—Philosophy and Practices of Vocational Education (3)
- Ind 5-929—Analysis and Course Organization (3)
- Ind 5-930—Administration of Industrial Education (3)
- Ind 5-950—Vocational Education Surveys (3)
- Ind 5-952—Industrial Education Workshop (1 to 6)
- Ind 5-953—Conference Leading Techniques (3)
- Ind 5-955—Independent Study (1 to 9)
- Ind 5-956—Vocational Guidance (3)

MAJOR IN INDUSTRIAL EDUCATION FOR THE B.A. DEGREE

(Industry)

BASIC COURSES

- Ind 1-501
- Select three with adviser: 1-301, 1-601, 1-701, 1-733, 1-802 or 1-803, 3-140

THEORY COURSES

- Ind 0-900, 3-950, 3-951, 3-971, 5-928, 5-953

CONCENTRATION

- Industrial block (20 cr)

ELECTIVES

- Industrial education courses (selected with adviser)

Total (72)

Supporting Courses Required—Chemistry (10) or physics (12); mathematics (4); economics (4); psychology (5).

MAJOR IN INDUSTRIAL EDUCATION FOR THE B.S. DEGREE

(Industrial Arts Teaching)

Recommended for students intending to seek teacher certification.

BASIC COURSES

Ind 1-101, 1-301, 1-501, 1-601, 1-701, 1-802

THEORY COURSES

Ind 0-900, 3-920, 3-921, 3-950, 5-922, 5-924 (or Educ 5-921), 5-928, 5-929

CONCENTRATION

Industrial block (20 cr) or two industrial blocks (10 cr each)

ELECTIVES

Industrial education courses (selected with adviser)

Total (64)

Supporting Courses Required—Chemistry (5); physics (4); mathematics (4); economics (4).

COMPREHENSIVE MAJOR IN INDUSTRIAL EDUCATION FOR THE B.S. DEGREE—OPTION I

(Secondary Industrial-Vocational Teaching)

Recommended for students intending to seek secondary teacher certification.

BASIC COURSES

Ind 1-101, 1-301, 1-501, 1-601, 1-701, 1-802

THEORY COURSES

Ind 0-900, 3-920, 3-921, 3-950, 5-922, 5-924 (or Educ 5-921), 5-928, 5-929

CONCENTRATION

Two industrial blocks (20 cr each) taken from either drawing, electricity-electronics, graphic arts, metals, power, woods, or construction

ELECTIVES

Industrial education courses (selected with adviser)

Total (90)

Supporting Courses Required—Chemistry (5); physics (4); mathematics (4); economics (4).

COMPREHENSIVE MAJOR IN INDUSTRIAL EDUCATION FOR THE B.S. DEGREE—OPTION II

(Vocational-Technical Teaching)

Recommended for students intending to seek teacher certification.

THEORY COURSES

A minimum of 24 credits including Ind 3-921, 5-922, 5-924, 5-928, 5-929, 5-953, and a minimum of 6 credits selected from Ind 3-975, 5-926, 5-930, 5-950, 5-952

CONCENTRATION

A minimum of 24 credits of technical course work (selected with adviser)

ELECTIVES

A total of 45 industrial education credits selected with an adviser or an allowance of a maximum of 45 credits as free industrial education electives for previously acquired technical competence. Advanced credit, if allowed, will not be granted until all other degree requirements have been completed.

Total (93)

Supporting Courses Required—Chemistry (5); physics (4); mathematics (4); economics (4).

MINOR IN INDUSTRIAL EDUCATION FOR THE B.A. DEGREE

(Industry)

THEORY COURSES

Ind 3-950, 3-951, 3-971, 5-928, 5-953

CONCENTRATION

Industrial block (15 cr) or 15 credits selected from Ind 1-110, 1-301, 1-501, 1-601, 1-701, 1-733, 1-802 or 1-803, 3-140

ELECTIVES

Industrial education courses (selected with adviser)

Total (38)

COURSES**0-900. INTRODUCTION TO INDUSTRIAL EDUCATION.** (No cr)

An orientation and introduction to the Department of Industrial Education.

1-101. BASIC WOOD TECHNOLOGY. (5 cr, §1-100, §1-130; 3 hrs lect, 7 hrs lab)

Introduction to woodworking and finishing. Use of common hand tools, fundamental skills, processes. Wood identification and application of stains, varnish, lacquer, etc., by hand and spray methods.

1-110. MACHINE WOODWORKING. (5 cr; prereq 1-101; 2 hrs lect, 8 hrs lab)

Maintenance, adjustment, and operation of woodworking machinery; safety precautions; practice in construction of wood projects using machinery.

1-301. POWER SYSTEMS. (5 cr, §1-300; 5 hrs lect)

Introduction to mechanisms and systems utilized in our society. The study of systems and sources including those employed in construction, communication, transportation, and materials processing. Primary emphasis will be placed upon power for transportation.

1-310. SMALL GASOLINE ENGINES. (2 cr; 4 hrs lect-lab)

Reconditioning, tune-up, and safety procedures employed in the maintenance and operation of two- and four-cycle small engines.

1-330. BASIC AERONAUTICS. (3 cr; 4 hrs lect, 2 hrs lab; offered when feasible)

Aerospace fundamentals in terms of current technology; industrial applications; basic aviation concepts.

1-353. AUTOMOTIVE MECHANICS. (4 cr, §1-350; 2 hrs lect, 4 hrs lab)

Internal combustion engine diagnosis and reconditioning; basic fuel, ignition, and drive circuits.

1-401. CRAFTS. (4 cr, §1-400, §3-420; 2 hrs lect, 6 hrs lab)

Basic techniques in leather, copper tooling, resin casting, embedding, laminating, hand layup procedures for canoes, etc., mold making, molding techniques in rotational, injection, vacuum forming, compression molding.

1-441. HOME MAINTENANCE. (2 cr, §1-440; 2 hrs lect, 2 hrs lab; offered when feasible)

General interest course covering all areas of home maintenance and repair. Basic mechanics and theory of operation for appliances and tools. Provides background for home mechanics course as presently taught in public schools.

Section 2—Major-Minor Requirements and Courses

- 1-501. BASIC DRAWING.** (4 cr, §1-500; 1 hr lect, 6 hrs lab)
Fundamental skills in use of instruments, orthographic projections, dimensioning, sectioning, and technical sketching.
- 1-511. TECHNICAL DRAWING I.** (4 cr, §1-520; prereq 1-501; 1 hr lect, 6 hrs lab)
Introduction to industrial drafting problems including sections, projections, dimensioning, and tolerances, design and working drawings.
- 1-540. AMERICAN BUILDING.** (3 cr; 3 hrs lect; offered 1972-73 and alt yrs)
A study of the historical influences, technological advances, and social issues that have influenced and shaped American building.
- 1-561. ARCHITECTURAL DRAWING I.** (5 cr, §1-550, §3-552; 2 hrs lect, 6 hrs lab)
Drafting techniques, conventions, drawing types, and details of construction as applied to light construction.
- 1-601. INTRODUCTION TO GRAPHIC ARTS.** (5 cr, §1-600; 3 hrs lect, 4 hrs lab)
Overview of the major printing processes. Lab experience in composition, design, presswork, screen process, pasteup, camera work, stripping, and binding.
- 1-611. PRINTING LAYOUT AND DESIGN.** (4 cr, §1-610; 2 hrs lect, 4 hrs lab; offered 1972-73 and alt yrs)
Introduction to principles of design. Creative problems in balance, proportion, harmony, size, color, typography, treatment of photos, paper selection, and special processes.
- 1-620. BASIC PHOTO TECHNOLOGY.** (3 cr; 2 hrs lect, 2 hrs lab)
Basic photographic principles. Lab experience in camera use, film and paper processing, contact and projection printing, mounting and finishing, and special techniques.
- 1-631. SCREEN PROCESS PRINTING.** (4 cr, §1-630; 2 hrs lect, 4 hrs lab; offered 1972-73 and alt yrs)
Screen process printing utilizing various types of stencils. Special and experimental techniques used to print on a variety of materials.
- 1-701. GENERAL METALS.** (5 cr, §1-700, §1-720; 2 hrs lect, 6 hrs lab)
Study of the basic tools, machines, metals, and processes common to the metals trades and manufacturing industries. Selected problems in forging, foundry, welding, sheet metal, ornamental ironwork, metal spinning, and other related areas.
- 1-710. BASIC WELDING.** (3 cr; 2 hrs lect, 4 hrs lab)
Basic principles and practices in oxyacetylene and electric arc welding of common metals. Identification, selection, preparation, testing, and checking of materials, electrodes, and weldments. Introduction to new techniques in welding.
- 1-733. BASIC MACHINE TOOL PRACTICE.** (5 cr, §1-730, §3-731; prereq 1-701; 2 hrs lect, 6 hrs lab)
Basic principles and practices of machine tool design, construction, and operation.
- 1-802. BASIC AC AND DC ELECTRICITY.** (5 cr, §1-800, §1-801; 5 hrs lect, 3 hrs lab)
Provides a background in electricity for students who intend to teach only a basic junior high school course in electricity and in industrial education areas other than electronics and for others who will terminate their study of electricity/electronics with this course. (Nature of electricity, power and energy, resistance, resistive networks, meters, magnetism, inductance, transformers, capacitors, RCL networks, motors, and generators.)
- 1-803. AC AND DC ELECTRICITY.** (5 cr, §1-800, §1-801; 5 hrs lect, 3 hrs lab)
Provides an in-depth study of AC and DC electricity for the student pursuing a course of study in electronics or majoring in other areas of science. (Nature of electricity, electrical units, resistive networks, network theorems, electrical measurements, magnetism, inductors, capacitors, motors, and generators.)
- 1-910. APPLIED MATHEMATICS FOR TECHNICIANS.** (4 cr, §Math 1-110; prereq 1 yr algebra and 1 semester geometry or §; 4 hrs lect, 1 hr exam or lab; offered when feasible)
Stresses algebraic and trigonometric applications, and skills used in technical courses in the Department of Industrial Education.
- 3-113. FURNITURE DESIGN, CONSTRUCTION.** (5 cr, §3-112, §1-430; prereq 1-110; 3 hrs lect, 7 hrs lab; offered when feasible)
Furniture manufacturing principles and processes. Development of design and construction in wood and upholstery. Major project utilizes essentials of wood construction and knowledge of upholstery materials, techniques.
- 3-121. BUILDING CONSTRUCTION.** (4 cr, §1-120, §3-111; prereq 1-110; 2 hrs lect, 6 hrs lab)

- Home building practices, light construction, prefabrication methods, use of tools, safety, interior cabinet construction, finishing, building materials.
- 3-140. WOOD IN INDUSTRY.** (3 cr; 2 hrs lect, 4 hrs lab; offered when feasible)
Industrial application of wood and wood products. Present and future sources of lumber; processes and future trends.
- 3-321. HYDRAULICS, PNEUMATICS, FLUIDICS.** (5 cr, §1-320, §3-352; prereq 1-301; 2 hrs lect, 6 hrs lab)
Physical principles and the functional operation of components utilized in hydraulic and pneumatic circuits.
- 3-354. AUTOMOTIVE FUEL AND ELECTRICAL SYSTEMS.** (4 cr, §3-351; prereq 1-353 and 1-803 or §; 2 hrs lect, 4 hrs lab)
Study of automotive fuel and electric components and circuit design incorporated in the modern automobile. A study of emission control equipment included.
- 3-512. TECHNICAL DRAWING II.** (4 cr, §3-521, §3-522; prereq 1-511; 1 hr lect, 6 hrs lab; offered 1972-73 and alt yrs)
Advanced problems in technical drawing: auxiliary drawings, revolutions, intersections, developments, graphs, and graphical analysis.
- 3-530. INDUSTRIAL DESIGN.** (4 cr, §3-510, §3-511; 3 hrs lect, 2 hrs lab; offered 1972-73 and alt yrs)
Analysis of the elements of contemporary design found in industrial products and projects.
- 3-543. MATERIALS OF CONSTRUCTION.** (4 cr, §3-541; 4 hrs lect)
Physical and mechanical properties of basic building materials and their applications in contemporary construction.
- 3-544. BUILDING ESTIMATING.** (4 cr, §3-542; prereq 1-561 or §; 2 hrs lect, 4 hrs lab; offered when feasible)
Estimating costs of equipment, material, and labor for building construction.
- 3-565. PRESENTATION TECHNIQUES.** (4 cr, §3-551; prereq 1-501 or 1-561; 1 hr lect, 6 hrs lab; offered 1973-74 and alt yrs)
Development of skills related to the preparation of presentation drawings and models.
- 3-570. INTRODUCTION TO PLANNING AND DESIGN.** (4 cr, §3-551; prereq 1-501 or 1-561; 2 hrs lect, 4 hrs lab; offered 1973-74 and alt yrs)
Study of the relationship between function, structure, construction methods, and materials as applied to contemporary light construction.
- 3-642. OFFSET LITHOGRAPHY.** (4 cr, §3-621, §3-640; prereq 1-601; 2 hrs lect, 4 hrs lab; offered 1973-74 and alt yrs)
Principles of offset lithography. Lab experience in planning, layout, composition, copy preparation, camera work, stripping, platemaking, and presswork.
- 3-643. ADVANCED OFFSET LITHOGRAPHY.** (4 cr, §3-641; prereq 3-642; 2 hrs lect, 4 hrs lab; offered when feasible)
Advanced work in offset printing including process color, keyline, register work, and operation and maintenance of larger presses.
- 3-702. METAL FABRICATION.** (5 cr, §3-721, §3-750; prereq 1-701; 2 hrs lect, 6 hrs lab; offered when feasible)
Study of principles, materials, methods, and efficiency of metals manufacturing. Emphasis on shaping and forming processes.
- 3-711. COMBINATION WELDING TECHNIQUES.** (3 cr; prereq 1-710; 2 hrs lect, 4 hrs lab; offered 1972-73 and alt yrs)
Principles and practices in modern welding methods with emphasis on MIG, TIG, nonferrous, cast iron, pipe, tube, and difficult position welding. Special materials, equipment, and techniques.
- 3-734. ADVANCED MACHINE TOOL PRACTICE.** (5 cr, §3-731, §3-732; prereq 1-733; 2 hrs lect, 6 hrs lab; offered 1972-73 and alt yrs)
Continuation of Ind 1-733 with emphasis on advanced machining and tooling operations. Introduction to new innovative machine processes and machinability variables.
- 3-735. NC AND EDM MACHINING.** (4 cr; prereq 3-734; 2 hrs lect, 4 hrs lab; offered when feasible)
Intensive study of modern machine technology with emphasis on numerically controlled machines, electrical discharge machinery, tungsten carbide tooling, and other recent innovations.

Section 2—Major-Minor Requirements and Courses

- 3-801. AC NETWORK THEORY.** (5 cr, §3-800; prereq 1-803 or #; 5 hrs lect, 3 hrs lab)
Analysis of RCL circuits, resonant circuits, filter circuits, and special techniques to analyze AC networks.
- 3-823. ELECTRON TUBE DEVICES AND CIRCUITRY.** (5 cr, §3-820, §3-821; prereq 1-803 or #; 5 hrs lect, 3 hrs lab; offered 1973-74 and alt yrs)
Theory and operation of various electron tubes and their associated circuitry.
- 3-824. SPECIAL APPLICATIONS IN ELECTRONIC DESIGN.** (5 cr, §3-822; prereq 3-823, 3-833 or #; 5 hrs lect, 2 hrs lab; offered 1973-74 and alt yrs)
Applications of solid state devices and electron tubes in television, industrial control systems, and instrumentation.
- 3-833. SOLID STATE DEVICES.** (5 cr, §3-830; prereq 1-803 or #; 5 hrs lect, 3 hrs lab; offered 1972-73 and alt yrs)
Theory of operation of transistors, FET's, diodes, SCR's, triacs, etc., and the immediate circuitry associated with these devices using approximation methods and equivalent circuit parameters.
- 3-834. SOLID STATE CIRCUITRY.** (5 cr, §3-831; prereq 3-833 or #; 5 hrs lect, 3 hrs lab; offered 1972-73 and alt yrs)
A study of solid state circuits, including integrated circuits, arranged to perform various functions individually and in combination, oscillators, cascaded amps., special amps., regulators, switches, wave shapers, etc.
- 3-851. DIGITAL COMPUTER DESIGN FUNDAMENTALS.** (5 cr, §3-850; prereq 3-833 or #; 5 hrs lect, 3 hrs lab; offered 1972-73 and alt yrs)
The application of electronic circuits to computers and digital measurements; how computers perform operations, and basic principles of programming. Course is electronics-oriented rather than programming-oriented.
- 3-920. EQUIPMENT AND FACILITY PLANNING.** (2 cr; prereq 9 cr in area of concentration or #)
Shop standards, planning, equipment layout and specifications, tool and material storage, and shop safety standards.
- 3-921. TEACHING VOCATIONAL SUBJECTS.** (3 cr)
Conduct of school classes, methods of presentation; instructional devices; plans, demonstrations; drill, grading, reports, and records; general concepts and techniques of method particularized for school shop situations.
- 3-950. SAFETY EDUCATION.** (4 cr)
A comprehensive approach to the problems of safety in the school, community, traffic, and industrial world; problem recognition, the human factor, and social implications are considered.
- 3-951. INDUSTRIAL PRACTICES AND PROCESSES.** (3 cr)
Industrial materials; manufacturing processes and current practices; industrial plants, plant organization, products, production methods, and product development.
- 3-971. TRAINING PROGRAMS IN INDUSTRY.** (2 cr; offered when feasible)
Study of industrial training methods including the conduct and development of industrial training programs; the industrial training director.
- 3-975. INDUSTRIAL SUPERVISION.** (3 cr; prereq # or Upper Division standing)
Fundamental elements of industrial supervision; human relations, communication, decision making, exercising authority, and performance evaluation; examination of industrial supervisory practices and factors pertinent to successful supervision.
- 5-890. SEMINAR: NEW ELECTRONIC DEVICES.** (3 to 6 cr; prereq 3-833 or #; 3-6 hrs lect, 3-6 hrs lab; offered when feasible)
Acquaints the student with the operation of new electronic devices and how they are incorporated in circuits.
- 5-922. TESTS IN VOCATIONAL SUBJECTS.** (3 cr)
Study and application of principles of evaluation to shop and drawing subjects.
- 5-923. GENERAL SHOP.** (3 cr; offered when feasible)
Theory of multiple shop organization; current practice as to types of shops; equipment; instructional materials and procedures; pupil personnel plans.
- 5-924. AUDIO-VISUAL MATERIALS.** (3 cr, §Educ 5-921; prereq 9 cr in education or #)
Characteristics, advantages, limitations, and practical use of audio-visual materials of nonprojected and projected types; practice in the operation of audio-visual equipment.

- 5-926. COORDINATION TECHNIQUES.** (3 cr; prereq 5-928 or #)
Coordination in trade schools, part-time programs, and cosmopolitan high schools; information, guidance, and training for coordinators.
- 5-928. PHILOSOPHY AND PRACTICES OF VOCATIONAL EDUCATION.** (3 cr)
Development and characteristics of vocational education; social and economic significance; plans of organizational types of schools and classes; state and federal aid; teacher preparation.
- 5-929. ANALYSIS AND COURSE ORGANIZATION.** (3 cr)
Need for and types of instructional analysis; content of courses selected and arranged for common and special teaching situations; both general and vocational applications considered.
- 5-930. ADMINISTRATION OF INDUSTRIAL EDUCATION.** (3 cr, §5-925; prereq 5-928 or #; offered when feasible)
General and vocational phases; objectives, programs, and practices; laws, rulings, and standards for aid; significant literature.
- 5-950. VOCATIONAL EDUCATION SURVEYS.** (3 cr; prereq grad or #; offered when feasible)
Analysis of various surveys, need for survey findings and survey techniques; preparation of plans for making surveys; interpretation and use of findings.
- 5-952. INDUSTRIAL EDUCATION WORKSHOP.** (1 to 6 cr [may be repeated for a maximum of 6 cr]; prereq tchg exper or #)
Intensive study of problems in industrial education; areas of concentration will vary with each successive offering.
- 5-953. CONFERENCE LEADING TECHNIQUES.** (3 cr; prereq #)
Purposes, advantages, and limitations of conference method; instruction in techniques of conference; experience in planning, leading, and evaluating conferences and in writing summaries.
- 5-955. INDEPENDENT STUDY.** (1 to 9 cr [may be repeated for a maximum of 9 cr]; prereq jr or sr or #)
Individualized research or design in electronics, power, metals, design, drafting, graphic arts, woods, or professional studies related to the candidate's professional and/or technical concentration.
- 5-956. VOCATIONAL GUIDANCE.** (3 cr; prereq 0-900 and 3-921 or #; offered when feasible)
History of educational and vocational guidance movement; typical public school means and methods; types and uses of occupational information; duties of the teacher and counselor; organization and relationships.

INTERDISCIPLINARY STUDIES (IS)

(Interdivisional Committee)

COURSES

- 3-100. MAN'S ENVIRONMENT AND HIS FUTURE.** (3 cr; 2 hrs lect, 1 hr discussion-rec)
Man's relationship to the animate and inanimate world in and on which he lives, the consequences to his environment of his actions, the implications of various philosophical and economic principles on his future existence, and some of the possible choices he has for long-term survival on a world of finite resources. Several lecturers; term paper; discussion groups.

JOURNALISM (Jour)

(English Department)

See Communications minor

COURSES

- 1-102. INTRODUCTION TO MASS COMMUNICATIONS.** (4 cr)
A survey of contemporary mediums of communication, particularly newspapers, television, radio, and advertising, with emphasis upon the challenges they face and the criticisms they must bear. The role of the mass media in a democratic society compared with authoritarian press systems. A preview of sophisticated communication systems in various stages of development.
- 1-105. JOURNALISTIC WRITING.** (4 cr; prereq Liberal Education Requirement A, Freshman Composition)
Functions and responsibilities of communication agencies, examined from the point of view of the professional journalist. Laboratory exercises in journalistic writing and fact-gathering.
- 1-110. VISUAL COMMUNICATION.** (3 cr; prereq Liberal Education Requirement A, Freshman Composition)
Introduction to functions of visual communication in news and advertising in print and electronic media. Evaluation and criticism of visuals in creative typography, photography, and other visual techniques. Lectures, projects, and critiques.
- 1-120. MASS COMMUNICATIONS LAW.** (2 cr; prereq 1-105 or #)
Basic law of defamation, contempt, privacy, obscenity, and other legal rules affecting journalistic practice.
- 1-202. NEWS REPORTING.** (4 cr; prereq 1-105)
Lectures and laboratory in advanced problems of reporting, feature writing and interpretive reporting; access to information.
- 3-121. ETHICAL PROBLEMS IN JOURNALISM.** (4 cr; prereq 1-202 or #)
An investigation into contemporary problems created by the adversary relationship between journalists and several institutions within our society, particularly government. Definition of the role of the journalist in a free society.
- 3-202. INTERPRETIVE REPORTING.** (4 cr; prereq 1-202)
Interpretive and investigative reporting. Advanced problems in material gathering and specialized reporting.
- 3-302. NEWS EDITING.** (4 cr; prereq 1-202)
Lectures and laboratory practice in basic copy editing problems and techniques.
- 3-402. HISTORY OF JOURNALISM.** (4 cr)
Development of newspapers and periodicals from early beginnings in Europe to present day; rise of radio and television; relation of communications developments to political, economic, and social trends in the United States.

LATIN (Lat)

(Language Department)

COURSES

- 1-101/1-102/1-103. BEGINNING LATIN.** (5 cr each; offered when feasible)
Elements of grammar and reading of selections of elementary Latin texts, i.e. Cornelius Nepos, *De Bello Gallico*.
- 1-201/1-202/1-203. INTERMEDIATE LATIN.** (3 cr each; prereq 1-103; offered when feasible)
Selected readings in classical authors and grammar review.

MATHEMATICS (Math)

Advisers—Professor McEwen; Associate Professors S. Anderson, Burgstahler, J. Nelson; Assistant Professors M. Miller, G. Peterson; Instructors D. Anderson, Guckin, Helfman, Kuo, Lacey, Lash, W. Olson

All mathematics majors and minors must complete 1 year of elementary calculus at the level of Math 1-286/1-287/3-288 (or the equivalent CRICISAM calculus sequence) and each must attain at least minimum competency in computer programming. Neither this floor preparation nor any preparatory course work required are included in the credit counts indicated below. No special proof of programming skill is expected of those who pass either Math 3-501 or the CRICISAM calculus sequence. Those claiming competency on the basis of high school programming courses or other experience should arrange to have this requirement waived at the time Upper Division papers are filed. Additional requirements for various majors and minors follow.

MAJOR IN MATHEMATICS FOR THE B.A. DEGREE

Required courses beyond the floor preparation described above include:

Math 3-320—Vectors and Matrices (4)	Math 3-931—Project for Majors (1)
Math 3-350—Calculus IV (5)	Electives in mathematics courses numbered above 3-030 (22)
Math 3-670—Modern Algebra I (4)	
Math 3-699—Intermediate Analysis (4)	
	Total (40)

All B.A. majors must take Math 5-701/5-702 (Advanced Calculus I and II) or Math 5-671/5-672 (Modern Algebra II and III). It is essential that students considering graduate studies in mathematics take both of these sequences and, in addition, they should take Math 5-730/5-731/5-732 (Applied Mathematics I-II-III) and as many other 5-prefix mathematics courses as their schedules permit.

MINOR IN MATHEMATICS FOR THE B.A. DEGREE

Ten credits in mathematics courses beyond the floor preparation selected from among courses listed after Math 3-288 in the course descriptions below.

MAJOR IN MATHEMATICS FOR THE B.S. DEGREE

There are two distinct options for the B.S. degree in mathematics. The first is intended for students planning careers in secondary school teaching while the second is intended for those planning careers in industry or in actuarial science.

OPTION 1: Required for students seeking teacher certification.

Math 3-240—Fundamentals of Mathematics (2)
Math 3-320—Vectors and Matrices (4)
Math 3-441—Contemporary Geometry (4)
Math 3-470—Advanced Topics for Teachers (3)
Math 3-670—Modern Algebra I (4)
Math 3-699—Intermediate Analysis (4)
Math 3-931—Project for Majors (1)
Math 5-590—Mathematical Probability, Statistics I (3)
Electives in mathematics courses numbered above 3-030 (6)

Total (31)

OPTION 2:

Math 3-320—Vectors and Matrices (4)
Math 3-350—Calculus IV (5)
Math 3-380—Differential Equations I (5)
Math 3-699—Intermediate Analysis (4)
Math 3-931—Project for Majors (1)
Math 5-590—Mathematical Probability, Statistics I (3)
Electives in mathematics courses numbered above 3-030 (18)

Total (40)

All Option 2 B.S. majors should consider the advantages of Math 5-521/5-522 (Computer Programming II and III) and Math 5-730/5-731/5-732 (Applied Mathematics I-II-III). Those pointing toward a career in actuarial

Section 2—Major-Minor Requirements and Courses

science should give Math 5-701/5-702 (Advanced Calculus I and II) a higher priority than the applied mathematics sequence and they should take Math 5-591 (Mathematical Probability, Statistics II) and any other probability and/or statistics courses that may become available before a new bulletin is printed.

MINOR IN MATHEMATICS FOR THE B.S. DEGREE

A minimum of 13 credits in mathematics beyond the floor preparation in courses numbered above 3-288. Those desiring teaching certification must complete at least two courses from the following four areas: Foundations of Mathematics, Abstract Algebra, Geometry, and Probability-Statistics.

COURSES

- 1-080. MATHEMATICS I, ELEMENTARY EDUCATION.** (4 cr, §3-030; prereq elementary education major, 1 yr algebra)
Subject matter background for effective teaching at the elementary school level. Emphasizes the structure of number systems.
- 1-081. MATHEMATICS II, ELEMENTARY EDUCATION.** (4 cr; prereq elementary education major, 1-080 or Δ)
Continuation of Math 1-080 with greater emphasis on geometry and elementary algebra.
- 1-110. COLLEGE ALGEBRA.** (5 cr, §1-153, §1-185; students with 2 yrs or more of high school algebra may earn cr if work is of passing quality but no grades will be attached to these cr...others earn cr and grades as usual; prereq 1 yr each of algebra and geometry)
A course stressing basic manipulative skills and problem-solving techniques.
- 1-153. INTERDISCIPLINARY MATHEMATICS I.** (4 cr, §1-110, §1-150, §1-185; prereq 1 yr of elementary algebra)
Selected topics chosen for their suitability as preparation for a brief treatment of calculus. Course also includes work with electronic calculators and flowcharting.
- 1-154. INTERDISCIPLINARY MATHEMATICS II.** (4 cr, §1-151, §1-280, §1-282, §1-286, §3-501; prereq 1-153 or Δ)
Concepts from differential and integral calculus especially important in business, economics, and other social sciences as well as in the life sciences. Simple computer programs.
- 1-155. INTERDISCIPLINARY MATHEMATICS III.** (4 cr, §1-152; prereq 1-154 or Δ)
Selected topics from linear algebra and elementary probability.
- 1-185. PRE-CALCULUS ANALYSIS.** (5 cr; prereq 2 yrs algebra and 1 yr plane geometry)
Logic, elementary set theory, function concept, inequalities, theory of equations, trigonometric identities and equations, inverse functions, graphing.
- 1-281. CALCULUS II.** (5 cr, §1-284, §1-287; prereq 1-280; offered for last time during 1972-73)
Continuation of analytic geometry, vectors, and calculus begun in Math 1-280.
- 1-283/1-284. CRICISAM CALCULUS I AND II.** (5 cr each, §1-280, §1-281, §1-286/1-287; prereq 1-185 or 4 yrs high school mathematics)
First 2 quarters of a year sequence in computer-related calculus developed by the Center for Research in College Instruction of Science and Mathematics (CRICISAM). Includes problems to be run on UMD computer. Roughly parallels 1-286/1-287 sequence.
- 1-286/1-287. CALCULUS I AND II.** (4 cr each, §1-154, §1-280, §1-281, §1-283/1-284; prereq 1-185 or $3\frac{1}{2}$ yrs high school mathematics or Δ ; 4 hrs lect, 1 hr test)
Introduction to the calculus of functions of a single variable at a level suitable for engineers and mathematics and physical science majors. Also appropriate for other students who wish a more extensive treatment of calculus than is provided in the Interdisciplinary Mathematics I, II, III sequence.
- 3-025. MATHEMATICS TUTORIAL PROJECT.** (0 to 2 cr [may be repeated for a maximum of 4 cr]; prereq 1-281, 1-284, and Δ)
Student tutorial project for 1- and 3-prefixed mathematics courses under the supervision of a member of the mathematics department.

- 3-030. MATHEMATICS FOR LIBERAL EDUCATION.** (5 cr, §3-240, §3-670; not open to mathematics majors or minors)
Terminal course designed to develop an appreciation and understanding of the historical role of mathematics and of its relationship to the modern world.
- 3-240. FUNDAMENTALS OF MATHEMATICS.** (2 cr, §3-030; prereq mathematics majors or #)
Introduction to the foundations, fundamental concepts, and history of mathematics.
- 3-282. CALCULUS III.** (5 cr, §3-284, §3-288; prereq 1-281; offered for last time during 1972-73)
Further continuation of analytic geometry, vectors, and calculus begun in Math 1-280 and 1-281 plus treatment of series and of topics from linear algebra.
- 3-285. CRICISAM CALCULUS III.** (5 cr, §3-282, §3-288; prereq 1-284)
Continuation of Math 1-283 and 1-284.
- 3-288. CALCULUS III.** (4 cr, §3-282, §3-285; prereq 1-287; 4 hrs lect, 1 hr test)
Completion of the study begun in Math 1-286 and 1-287.
- 3-320. VECTORS AND MATRICES.** (4 cr, §3-282; prereq 1-154 or 1-185 or 1-286; 4 hrs lect, 1 hr test)
The essentials of linear algebra required for advanced mathematics courses and for many fields of application presented in a form suitable for students of mathematics, the physical sciences, business, economics, and other social sciences.
- 3-350. CALCULUS IV.** (5 cr; prereq 3-282 or 3-285 and 3-320 or 3-288 and 3-320)
Calculus of two and of several variables plus Green's, Stokes' and the divergence theorems.
- 3-380. DIFFERENTIAL EQUATIONS I.** (5 cr; prereq 3-282 or 3-285 or 3-288)
Solutions of first order equations, linear equations of second and higher order, systems of equations, operator methods, series solutions, existence and uniqueness of solutions, and applications.
- 3-441. CONTEMPORARY GEOMETRY.** (4 cr, §3-440; prereq 3-282 or 3-285 or 3-288)
Foundations of Euclidean geometry, Euclid's parallel postulate and its implications. Absolute geometry. Non-Euclidean geometries of Lobachevsky and Riemann, their relative consistency with Euclidean geometry and their applicability to physical space. Abstract axiom systems and models.
- 3-470. ADVANCED TOPICS FOR TEACHERS.** (3 cr; for option 1 B.S. majors only; prereq 3-282 or 3-285 or 3-288)
Portions of geometry, algebra, trigonometry, and analytic geometry not yet studied by the prospective teacher; intended to deepen understanding of secondary school mathematics.
- 3-501. FORTRAN PROGRAMMING.** (3 cr, §1-154, §3-285, §3-500; prereq 1-110 or 1-153 or 1-185 or #; 2 hrs lect, 2 hrs lab)
A study of FORTRAN and preparation of elementary programs.
- 3-519. COMPUTER PROGRAMMING I.** (4 cr, §3-520; prereq 3-285 or at least one calculus course together with 3-501 or #; 3 hrs lect, 2 hrs lab)
Numerical analysis; numerical solutions using computer techniques, iteration, roots of polynomials, systems of linear equations, differential equation solutions, integrations.
- 3-561. ELEMENTARY STATISTICS.** (4 cr, §3-560, §5-590; not open to mathematics majors; prereq 1 qtr college algebra or #)
Descriptive techniques; elementary probability; statistical inference; normal, t, chi-square, and F distributions; regression and correlation.
- 3-670. MODERN ALGEBRA I.** (4 cr; prereq 3-282 or 3-285 or 3-288; majors needing this course should complete it before or during 1st qtr of jr yr)
Introduction to algebraic systems including groups, rings, integral domains and fields; homomorphisms and isomorphisms; permutation groups and Cayley's theorem.
- 3-699. INTERMEDIATE ANALYSIS.** (4 cr; prereq 3-282 or 3-285 or 3-288)
A careful study of fundamental notions such as limit, convergence, continuity, and differentiability on which all reflective study of the calculus must rest.
- 3-931. PROJECT FOR MAJORS.** (1-3 cr; prereq Δ)
Each student majoring in mathematics is required to develop a project in mathematics under the supervision of a member of the department. This project can be a term paper, an oral report on independent study, or some other appropriate activity in mathematics.

Section 2—Major-Minor Requirements and Courses

- 3-970. SPECIAL TOPICS.** (1 to 3 cr [may be repeated for a maximum of 6 cr]; prereq Δ)
Directed individual reading and/or research in mathematics to be arranged with the instructor and the head of the department before registration.
- 5-326. LINEAR ALGEBRA.** (3 cr, §5-325; prereq 3-320 and 3-670)
A study of linear transformations and vector spaces including topics from orthogonality, canonical forms, bilinear forms, characteristic values and inner product spaces.
- 5-385. DIFFERENTIAL EQUATIONS II.** (3 cr; prereq 3-699) J Nelson
Uniqueness, comparison, and separation theorems; two-endpoint problems and Green's functions; Lipschitz condition and existence and uniqueness theorems; nonlinear equations, plane autonomous systems, Poincare phase-plane, stability and Liapunov functions; approximate solutions.
- 5-521/5-522. COMPUTER PROGRAMMING II AND III.** (3 cr each; prereq 3-519) Gergen
Number representations, computer arithmetic, stored computer logic and organization, address modification, looping, branching, machine language and symbolic programming, programming languages. Students use the UMD computer facilities as part of their course work.
- 5-590. MATHEMATICAL PROBABILITY, STATISTICS I.** (3 cr; prereq 3-282 or 3-285 or 3-288) M Miller
Axiomatic development of probability; discrete, univariate and multivariate random variables with their probability distribution; moments and moment generating functions.
- 5-591. MATHEMATICAL PROBABILITY, STATISTICS II.** (3 cr; prereq 5-590) M Miller
Sampling distributions, central limit theorem, principle of maximum likelihood interval estimation and tests of hypotheses.
- 5-671/5-672. MODERN ALGEBRA II AND III.** (3 cr each; prereq 3-670)
Theory of groups, rings, and fields. Selected topics from permutation groups, Sylow theorems, finite abelian groups, isomorphism theorems, polynomial rings, extension fields, Galois theory, finite fields, modules.
- 5-701/5-702. ADVANCED CALCULUS I AND II.** (3 cr each; prereq 3-699)
Sequences and series; limit superior, limit inferior, and an introduction to summability. Metric spaces; continuous functions on metric spaces, connectedness, completeness, and compactness. Sets of measure zero and the Riemann integral. Sequences and series of functions. Functions of several variables, partial differentiation, implicit functions, and integrals depending on a parameter.
- 5-730/5-731/5-732. APPLIED MATHEMATICS I-II-III.** (3 cr each; prereq 3-699 or #)
Laplace transformation, vector analysis, line and surface integrals, inner product and orthogonal sequences, Sturm-Liouville equation, Fourier series, partial differential equations.
- 5-760. GENERAL TOPOLOGY.** (3 cr; prereq 3-699 or #)
Introduction to fundamentals of general topology basic to modern analysis. Set theory, Euclidean spaces, metric spaces, topological spaces, continuity, connectedness, compactness, product spaces, axiom of choice, generalized convergence.
- 5-820. COMPLEX VARIABLES.** (3 cr; prereq 3-699; offered when feasible)
Complex numbers, derivatives, and integrals of analytic functions, elementary functions and their geometry. Cauchy's integral theorem and formula. Laurent expansions, evaluation of contour integrals by residues, fundamental theorem of algebra.
- 5-830. THEORY OF NUMBERS.** (3 cr; prereq 3-282 or 3-285 or 3-288; offered when feasible)
Elementary properties of integers; prime and composite numbers, Euclid's algorithm; congruences; the theorems of Fermat and Wilson; primitive roots; indices, Diophantine equations.
- 5-840. SET THEORY.** (3 cr; prereq 3-670 or #; offered when feasible)
Logic, sets and set operations on a nonaxiomatic level, Cartesian products, relations, functions, ordinal and cardinal numbers, lattices and axiomatization of set theory including axiom of choice and several axiom systems.
- 5-970. SPECIAL TOPICS.** (1-3 cr [may be repeated for a maximum of 6 cr]; prereq # and Δ ; offered when feasible)
Directed reading and/or research in mathematics.

Mathematics for High School Teachers

Sci 5-701. MATHEMATICS FOR HIGH SCHOOL TEACHERS I. (3 cr; prereq Δ ; offered summer only)

Topics from algebra, trigonometry, analytic geometry, and calculus, including theory of equations, binomial theorem, mathematical induction, probability, derivative, anti-derivative, definite integral, fundamental theorem of integral calculus, applications.

Sci 5-702. MATHEMATICS FOR HIGH SCHOOL TEACHERS II. (3 cr; prereq Δ ; offered summer only)

Introduction to modern mathematics. Sets, mappings, mathematical systems, theory of numbers, congruences, vector spaces, and matrices.

MUSIC (Mu)

Advisers—First quarter in residence: Associate Professor Coffman.

Thereafter: Student's principal applied music teacher.

The Department of Music offers curricula which lead either to the bachelor of science degree, in preparation for the teaching of music in the public schools, or to the bachelor of arts degree, in preparation for graduate study or careers in professional music. Both curricula are concerned with deepening a responsiveness to the expressive nature of music, with developing skill and understanding in the theory and performance of music, and with leading the student toward a realistic appraisal of his future role in the musical development of the American community. Additionally, the teaching curriculum strives to develop competency in the application of musical values to the teaching of children and youth.

The similarity of these curricula, for the first two years, allows the student and faculty time to determine the extent and direction of the student's future study. His academic and applied music records are reviewed; he is counseled by his adviser. In the Upper Division, the student is committed to fulfilling the requirements for either the bachelor of arts with its three possible areas of concentration or the bachelor of science in music education.

Individual lessons are regularly required of music majors in the principal field, and quarterly juries are held. Generally, students are advised not to enroll in more than two phases of individual and/or class instruction concurrently.

Each student majoring or minoring in music is expected to make at least one solo appearance during each year's study in his principal field.

The music major is expected to progress to the level of advanced performance in applied music by the end of his second year. If he has not qualified for advanced standing in performance by his junior year he incurs the penalty of additional time required to complete the Upper Division credits.

The B.A. major with a concentration in applied music takes two lessons each week for 2 credits. A total of 24 credits in lessons is required with 12 being at the advanced level. The B.S. major must earn 12 credits in his principal applied area with at least 6 credits in advanced lessons.

The Department of Music has been accredited by the National Association of Schools of Music since 1942. Requirements as set forth in this bulletin for both the B.A. and B.S. degrees are in accordance with the published regulations of this association.

Music Major Programs

Recital attendance is required of all music majors when currently enrolled in individual instruction.

Honors Program—Qualified music majors are selected during their junior year winter quarter advisement period. They must have maintained a scholastic average of 3.00 and achieved “advanced standing in performance.” Candidates are required to pass comprehensive examinations embracing seminars and individual projects. See department head for further details.

MAJOR IN MUSIC FOR THE B.A. DEGREE

This major provides an appropriate background for those approved candidates who wish to major in music within a liberal arts program and who are preparing themselves for such careers as musicologists, performers, composers, music librarians, and college teachers.

The degree recognizes three areas of concentration as follows: (a) music history and literature, (b) music theory, (c) applied music.

Each candidate, with the aid of his adviser, judiciously selects liberal education courses from English composition and literature, foreign language, history, social studies and philosophy, fine arts, natural science, and mathematics. Foreign language is strongly recommended for vocal majors and those planning on graduate work.

A. Concentration in Music History and Literature

Piano requirement: Completion of sophomore B.M. standards
Individual instruction (12)
Mu 0-000—Recital Attendance (0)
Mu 1-111/1-112/1-113—Basic Music Theory (9)
Mu 1-121/1-122/1-123—Intermediate Theory (9)
Mu 1-221/1-222/1-223—Musical Styles (6)
Mu 3-106—Form and Analysis (3) (pre-req for orchestration)

Mu 3-112—Orchestration (3)
Mu 3-118—Contrapuntal Techniques (3)
Mu 3-201/3-202/3-203—History of Music (9)
Mu 3-221/3-222/3-223—Music Literature (9)
Mu 5-201—Advanced Music History (9)
Orchestra, or band, or chorus (3)
Total (75)

B. Concentration in Music Theory

Piano requirement: Completion of sophomore B.M. standards
Individual instruction (12)
Mu 0-000—Recital Attendance (0)
Mu 1-111/1-112/1-113—Basic Music Theory (9)
Mu 1-121/1-122/1-123—Intermediate Theory (9)
Mu 1-221/1-222/1-223—Musical Styles (6)
Mu 3-106—Form and Analysis (3)
Mu 3-112—Orchestration (3)

Mu 3-118—Contrapuntal Techniques (3)
Mu 3-124—Composition (3)
Mu 3-127—Projects in Orchestration (3)
Mu 3-201/3-202/3-203—History of Music (9)
Mu 3-221/3-222/3-223—Music Literature (6) (any 2 qtrs)
Mu 5-129—Conducting, Arranging, Composition (3) (take composition)
Orchestra, or band, or chorus (6)
Total (75)

C. Concentration in Applied Music

Approved candidates take two lessons per week each quarter for 4 years. A recital is required.

Individual instruction (24)
Mu 0-000—Recital Attendance (0)
Mu 1-111/1-112/1-113—Basic Music Theory (9)
Mu 1-121/1-122/1-123—Intermediate Theory (9)
Mu 1-221/1-222/1-223—Musical Styles (6)
Mu 3-106—Form and Analysis (3)
Mu 3-112—Orchestration (3)
(or) Mu 3-118—Contrapuntal Techniques (3)

Mu 3-201/3-202/3-203—History of Music (9)
Mu 3-221 or 3-222 or 3-223—Music Literature (3)
Mu 5-129—Conducting, Arranging, Composition (3) (take Form and Analysis under individual projects)
Orchestra, or band, or chorus (6) (some choral experience is urged)
Total (75)

MAJOR IN MUSIC FOR THE B.S. DEGREE

Recommended for students intending to seek teacher certification.

This major, designed for teacher education in music, seeks to develop basic musicianship skills, to insure performance proficiency, and to relate these to the music teaching processes. Essential to artistic music teaching is a thorough competence in a principal performing medium. This is achieved by private instruction, intensive practice, solo performances, and ensemble participation. A grade IV piano proficiency is required. Nonpianists must take Mu 1-421/1-422/1-423 (Piano Class) concurrently with Mu 1-111/1-112/1-113 (Basic Music Theory). See *Class Schedule* for proper section. Nonpiano majors with insufficient piano background should begin immediately with class or private piano. Piano majors should include a year in voice.

Ensemble Credit—normally, the student takes 12 quarters in his principal major ensemble (orchestra, or band, or chorus). It is recommended that additional credits be earned in major ensembles.

If one enrolls concurrently in both Mu 1-512 (Chorale) and 1-511 (Concert Choir) or 1-502 (Varsity Band) and 1-501 (Concert Band) only one will count toward totals in liberal education for a music major or minor.

Mu 3-605 (Instrumental Music in the Schools) applies its 3 credits toward requirements in professional education. These are not counted on the music major.

REQUIREMENTS

Mu 0-000 (each qtr)—Recital Attendance (0)

Individual instruction, principal field(s) (12)

Class lessons (7)

One credit each in 1-451 Strings; 1-461 Woodwinds; 1-471 Brass; 1-483 Percussion; 1-411 Voice (voice majors take 1-417 Diction); plus 2 additional credits in one or more of these class areas

Mu 1-111/1-112/1-113—Basic Music Theory (9)

Mu 1-121/1-122/1-123—Intermediate Theory (9)

Mu 1-221/1-222/1-223—Musical Styles (6)

Mu 3-106—Form and Analysis (3)

Mu 3-112—Orchestration (3)

Mu 3-118—Contrapuntal Techniques

(or) Mu 3-124—Composition

(or) Mu 3-127—Projects in Orchestration

(or) Mu 3-128—Bandstratation (3)

Mu 3-201/3-202/3-203—History of Music (9)

Mu 3-597/3-598/3-599—Conducting (3)

Mu 3-605—Instrumental Music in the Schools (3)

Mu 3-655—Vocal Music in the Schools (3)
Orchestra, or band, or chorus (1 credit each quarter) (12)

Small ensemble, recital electives (3)

1-503 Stage Band; 1-514 Vocal Chamber; 1-554 String Chamber; 1-564 Woodwind Chamber; 1-574 Brass Chamber; 1-584 Percussion Chamber; 3-300 Recital; 3-327 The Art of Accompanying; 3-521 Opera Workshop

Electives (11)

Additional work in any combination in the areas of conducting, applied lessons, class lessons, major ensembles, and minor ensembles (8)

One course from the group numbered 5-000 (3)

Total (93)

Music Minor Programs

Recital attendance is required of all music minors when currently enrolled in individual instruction. A grade III piano proficiency is required. Nonpianists must take Mu 1-421/1-422/1-423 (Piano Class) concurrently with Mu 1-111/1-112/1-113 (Basic Music Theory). See *Class Schedule* for proper section. Pianists who cannot sight-read simple accompaniments must register for piano. Advanced pianists may be excused by passing a piano exemption examination. They may then fulfill their 9-credit applied requirement in vocal and/or instrumental study.

MINOR IN MUSIC FOR THE B.A. DEGREE

Individual instruction (9)	Mu 1-221/1-222/1-223—Musical Styles (6)
Mu 0-000—Recital Attendance (0)	Orchestra, or band, or chorus (6)
Mu 1-111/1-112/1-113—Basic Music Theory (9)	Total (30)

MINOR IN MUSIC FOR THE B.S. DEGREE

Individual instruction (9)	Mu 3-605—Instrumental Music in the Schools (3)
Mu 0-000—Recital Attendance (0)	(or) Mu 3-655—Vocal Music in the Schools (3)
Mu 1-111/1-112/1-113—Basic Music Theory (9)	Orchestra, or band, or chorus (6)
Mu 1-221/1-222/1-223—Musical Styles (6)	Total (35)
Mu 3-597/3-598—Conducting (2)	

MINOR IN MUSIC FOR THE ELEMENTARY EDUCATION MAJOR—B.S. DEGREE

If piano exemption examination is passed, the candidate fulfills 3 credits in applied voice and remaining 3 credits in applied elective.

Individual instruction (6)	Mu 1-511—Concert Choir (6)
Mu 0-000—Recital Attendance (0)	(or) Mu 1-512—Chorale (6)
Mu 1-111/1-112/1-113—Basic Music Theory (9)	Mu 3-621—Elementary School Music Teaching (3)
Mu 1-221/1-222/1-223—Musical Styles (6)	Total (30)

COURSES

All individual instruction in principal and secondary fields, major and minor ensembles, opera workshop, and recital (individual programs) may be repeated for credit.

0-000. RECITAL ATTENDANCE. (No cr; regis required each qtr for music majors and minors when enrolled in private instruction)
Attendance at scheduled musical events.

1-001. INTRODUCTION TO MUSIC. (3 cr; not for music majors or minors unless specified by adviser; 3 hrs lect, 1 hr listening period per wk)
The layman's listening process, with various aesthetic, historical, and structural studies designed to develop understanding and enjoyment of music.

1-111/1-112/1-113. BASIC MUSIC THEORY. (3 cr each; prereq ¶1-421 for non-pianists)
A comprehensive study of rhythms, melodies, and harmonies based upon aural perception and promoted through coordinated experiences in ear training, sight-singing, and keyboard harmony.

1-121/1-122/1-123. INTERMEDIATE THEORY. (3 cr each; prereq 1-113)
A detailed study of tertian harmony, vocal and instrumental analysis, and creative writing coordinated with ear training, sight-singing, and keyboard harmony.

1-221/1-222/1-223. MUSICAL STYLES. (2 cr each per qtr; prereq 1-001 or #; 2 hrs lect, 1 hr lab)
An introductory study of how music, growing out of its own past, has been shaped.

1-311. VOICE. (1 to 2 cr [may be repeated for a maximum of 12 cr]; prereq #)
Individual lessons.

1-321. PIANO. (1 to 2 cr [may be repeated for a maximum of 12 cr]; prereq #)
Individual lessons.

1-331. ORGAN. (1 to 2 cr [may be repeated for a maximum of 12 cr]; prereq #)
Individual lessons.

- 1-351. **STRINGS.** (1 to 2 cr [may be repeated for a maximum of 12 cr]; prereq #)
Individual lessons.
- 1-361. **WOODWINDS.** (1 to 2 cr [may be repeated for a maximum of 12 cr]; prereq #)
Individual lessons.
- 1-371. **BRASS.** (1 to 2 cr [may be repeated for a maximum of 12 cr]; prereq #)
Individual lessons.
- 1-381. **PERCUSSION.** (1 to 2 cr [may be repeated for a maximum of 12 cr]; prereq #)
Individual lessons.
- 1-411. **VOICE CLASS.** (1 cr [may be repeated for a maximum of 3 cr]; not open to voice majors)
Group instruction in essential elements of tone production.
- 1-417. **DICTION.** (2 cr [may be repeated for a maximum of 6 cr]; prereq voice major or #)
Proper enunciation of languages commonly found in vocal literature.
- 1-421/1-422/1-423. **PIANO CLASS.** (1 cr each; not open to piano majors)
Group instruction for those with little or no formal piano instruction. Emphasis on developing skill in sight-reading.
- 1-451. **STRING CLASS.** (1 cr [may be repeated for a maximum of 6 cr])
Beginning group instruction on instruments of the string choir.
- 1-461. **WOODWIND CLASS.** (1 cr [may be repeated for a maximum of 6 cr])
Beginning group instruction on instruments of the woodwind choir.
- 1-471. **BRASS CLASS.** (1 cr [may be repeated for a maximum of 6 cr])
Beginning group instruction on instruments of the brass choir.
- 1-483. **PERCUSSION CLASS.** (1 cr)
Beginning group instruction on the percussion instruments.
- 1-501, 3-501. **CONCERT BAND.** (1 cr each [may be repeated for a maximum of 12 cr])
Field formations (first half of fall quarter); study and performance of transcribed and original concert literature. Selected instrumentation winter and spring.
- 1-502, 3-502. **VARSITY BAND.** (1 cr each [may be repeated for a maximum of 12 cr])
The study and performance of concert band literature.
- 1-503, 3-503. **STAGE BAND.** (1 cr each [may be repeated for a maximum of 12 cr]; prereq #)
Study and performance of stage band literature.
- 1-511, 3-511. **CONCERT CHOIR.** (1 cr each [may be repeated for a maximum of 12 cr]; prereq audition)
Study and performance of sacred and secular literature from all periods by a selected group.
- 1-512, 3-512. **CHORALE.** (1 cr each [may be repeated for a maximum of 12 cr])
Sight-reading and study of large choral works.
- 1-514, 3-514. **VOCAL CHAMBER MUSIC.** ($\frac{1}{2}$ cr each [may be repeated for maximum of 6 cr]; regis for cr is also permitted for those regularly assigned as accompanists to adv students)
- 1-551, 3-551. **ORCHESTRA.** (1 cr each [may be repeated for a maximum of 12 cr]; open to performers with high school exper in strings, brass, woodwind, or percussion)
Reading and concert preparation of representative musical literature.
- 1-554, 3-554. **STRING CHAMBER MUSIC.** ($\frac{1}{2}$ cr each [may be repeated for a maximum of 6 cr]; regis for cr is also permitted for those regularly assigned as accompanists to adv students)
- 1-564, 3-564. **WOODWIND CHAMBER MUSIC.** ($\frac{1}{2}$ cr each [may be repeated for a maximum of 6 cr]; regis for cr is also permitted for those regularly assigned as accompanists to adv students)
- 1-574, 3-574. **BRASS CHAMBER MUSIC.** ($\frac{1}{2}$ cr each [may be repeated for a maximum of 6 cr]; regis for cr is also permitted for those regularly assigned as accompanists to adv students)
- 1-584, 3-584. **PERCUSSION CHAMBER MUSIC.** ($\frac{1}{2}$ cr each [may be repeated for a maximum of 6 cr]; regis for cr is also permitted for those regularly assigned as accompanists to adv students; prereq #)

Section 2—Major-Minor Requirements and Courses

- 1-611. MUSIC FUNDAMENTALS.** (2 cr; especially for soph in elementary education; is prereq to 3-621 unless equiv competence is shown by exam; before registering for 1-611, students should report at time posted for proficiency exam)
Elements of notation, keyboard, and sight-singing.
- 3-100. FACTORS OF MUSICIANSHIP.** (3 cr; offered when demand warrants)
For students who need to consolidate their theoretical comprehension and aural perception prior to student teaching. Required of all transfers coming in at the junior or senior level unless excused by examination.
- 3-106. FORM AND ANALYSIS.** (3 cr; prereq 1-111/1-112/1-113 and 1-121/1-122/1-123)
Visual and aural analysis of the structures of musical form, and their identification.
- 3-112. ORCHESTRATION.** (3 cr; prereq 3-106 or #)
Idiomatic scoring for instruments; individual assignments in the problems and possibilities of various combinations.
- 3-118. CONTRAPUNTAL TECHNIQUES.** (3 cr; prereq 3-106)
Practice in the use of linear devices in canon, inventions, fugues.
- 3-124. COMPOSITION.** (3 cr; prereq 3-106)
Creative writing; individual assignments in various media.
- 3-127. PROJECTS IN ORCHESTRATION.** (3 cr; prereq 3-112 or #; 1 class per wk; offered when demand warrants)
Extensive study of scores and recordings while working on individual assignments in the orchestration of music.
- 3-128. BANDSTRATION.** (3 cr; prereq 3-112 or #; offered when demand warrants)
Special scoring and transcribing techniques for symphonic band.
- 3-201/3-202/3-203. HISTORY OF MUSIC.** (3 cr each; prereq 1-123 or #; 3 hrs lect, 1 hr listening per wk)
Chronological study of the musical art, its essential forms and techniques, its principal composers; score analysis, record listening, concerts.
- 3-221/3-222/3-223. MUSIC LITERATURE.** (3 cr each; prereq Upper Division music major, or 1-001 or # for nonmajor; 3 hrs lect, 2 hrs lab)
Selected studies in music literature with changing topics as defined by type, period, or composer.
- 3-300. RECITAL.** (½ cr)
Individual programs.
- 3-311. ADVANCED VOICE.** (1 to 2 cr [may be repeated for a maximum of 12 cr]; prereq △)
Individual lessons.
- 3-321. ADVANCED PIANO.** (1 to 2 cr [may be repeated for a maximum of 12 cr]; prereq △)
Individual lessons.
- 3-327. THE ART OF ACCOMPANYING.** (1 cr; required for piano majors; prereq △)
Role of the accompanist; musical, psychological, and technical problems; class and laboratory, with individual assignments.
- 3-331. ADVANCED ORGAN.** (1 to 2 cr [may be repeated for a maximum of 12 cr]; prereq △)
Individual lessons.
- 3-341. HARPSICHORD.** (1 cr; prereq △)
Individual lessons.
- 3-351. ADVANCED STRINGS.** (1 to 2 cr [may be repeated for a maximum of 12 cr]; prereq △)
Individual lessons.
- 3-361. ADVANCED WOODWINDS.** (1 to 2 cr [may be repeated for a maximum of 12 cr]; prereq △)
Individual lessons.
- 3-371. ADVANCED BRASS.** (1 to 2 cr [may be repeated for a maximum of 12 cr]; prereq △)
Individual lessons.
- 3-381. ADVANCED PERCUSSION.** (1 to 2 cr [may be repeated for a maximum of 12 cr]; prereq △)
Individual lessons.

- 3-521. OPERA WORKSHOP.** (1 cr [6 cr maximum for voice or piano majors, 3 cr maximum for others]; primarily for secondary tchrs; prereq jr or #)
Production techniques and performances of solo and ensemble opera literature, standard and modern.
- 3-597/3-598/3-599. CONDUCTING.** (1 cr each; prereq 6 cr from chorale, concert choir, varsity band, concert band, or orchestra)
Techniques; reading and interpretation of vocal, condensed, and full orchestral/band scores; laboratory practice in rehearsal procedures.
- 3-604. CLASS STRING INSTRUCTION.** (2 cr [may be repeated once for cr]; prereq major or minor status in a string instrument or #; offered 1972-73 and alt yrs)
- 3-605. INSTRUMENTAL MUSIC IN THE SCHOOLS.** (3 cr; prereq music major or minor and jr standing)
The role and extent of the instrumental music program; methods and materials for beginning instruction, the school band and orchestra, and associated activities.
- 3-621. ELEMENTARY SCHOOL MUSIC TEACHING.** (3 cr; prereq ¶1-611 unless excused by exam)
Practical methods including purposes, program organization, lesson planning, and newer materials with actual demonstration of methods and discussion of typical classroom problems.
- 3-651. CHORAL PROBLEMS.** (1 cr [may be repeated for cr])
Voice as an ensemble instrument; pitch, diction, quality, acoustical problems in group singing; practice in vocal arranging.
- 3-655. VOCAL MUSIC IN THE SCHOOLS.** (3 cr; prereq music major or minor and jr standing)
The organization of general music and the development of choral activities in the schools; methods and materials for individual and group instruction.
- 3-661. APPLIED MUSIC TEACHING.** (1 cr [may be repeated once for cr]; prereq #)
Procedures and materials for class and individual instruction in approved fields of applied music; evaluation of solo literature; discussion of approved and experimental pedagogical practices; lesson observation and supervised student teaching.
- 5-121. PROJECTS IN MUSICIANSHIP SKILLS.** (3 cr [may be repeated for a maximum of 6 cr]; prereq 2 yrs music theory and adv performing ability)
Concentration upon one or more of the following: sight-reading, memorization, accompanying, ensemble playing. Supplementary work in ear training and music analysis provided where necessary.
- 5-129. CONDUCTING, ARRANGING, COMPOSITION.** (3 cr [may be repeated for a maximum of 9 cr]; prereq 2 yrs music theory and performing ability)
Serious work in any one or more of the above-named fields. Entire class shall constitute a performing ensemble for conducting experience and laboratory trial of student arrangements and compositions. Group assignments and/or individual projects required according to needs and concentrations of students.
- 5-161. PREPARATION OF GROUP PERFORMANCE.** (3 cr [may be repeated for a maximum of 6 cr]; prereq tchg exper or extensive exper in performing groups)
Concentration upon one or more of the following: rehearsal management and techniques, programming, staging, instrument care and maintenance, and special problems of opera and "musical" preparation. Organization of the class into one or more groups for actual production of a concert or operatic scenes.
- 5-169. CHORAL LITERATURE INTERPRETATION.** (3 cr; prereq #)
Musical and vocal techniques necessary for presentation of great choral compositions from Renaissance to 20th century.
- 5-174, 5-175. ADVANCED ORCHESTRATION.** (2 cr each; prereq 1-123) Murphy
Instruments of the orchestra together with a practical study of art of symphonic scoring.
- 5-201. ADVANCED MUSIC HISTORY.** (3 cr [may be repeated for a maximum of 9 cr]; prereq 3-203; 1 class per wk)
Directed music history study specializing in composer, genre, or period.
- 5-211, 5-212/5-213. HONORS SEMINAR.** (2 cr each; prereq music major, 3rd qtr jr, adv standing in performance, by invitation)
Individual study in selected areas.
- 5-221. PROSEMINAR: MUSIC HISTORY.** (3 cr; prereq 1-123 and 3-203 or #) Gauger
Specific problems in music history; lectures, discussions, reports, research papers,

Section 2—Major-Minor Requirements and Courses

and student performance; student becomes acquainted with available documentary sources and early instruments.

- 5-601. BASIC CONCEPTS IN MUSIC EDUCATION.** (3 cr; prereq tchg exper in music or #) Downs
Philosophical and psychological foundations of school music.
- 5-605. ADVANCED TOPICS IN MUSIC EDUCATION.** (3 cr; for experienced tchrs and qualified students; prereq #) Murphy
Various problems of individual and group instruction, especially at the secondary and collegiate levels.
- 5-606. WORKSHOP: (Various Titles To Be Assigned).** (1-3 cr each offering [no more than a total of 6 cr can be applied to a Master's degree program]; prereq #; offered summer only)
Planning and directing general music experiences at the elementary and/or secondary levels using specialized techniques and materials.
- 5-650. SUPERVISION OF SCHOOL MUSIC.** (3 cr; prereq 3-605, 3-655 or #)
Coordination of the music program, personnel, and facilities for instruction. Supervisory tasks and techniques.
- 5-656. PRACTICAL OPERATION OF SCHOOL MUSIC.** (3 cr; prereq 3-605, 3-655 or #)
Development and conduct of appropriate activities in general music, vocal, and instrumental phases.
- 8-333. GRADUATE APPLIED MUSIC.** (2 cr per qtr [maximum 6]; prereq placement test by Department of Music) A Anderson, Coffman, Downs, Ermey, Ferreira, Gauger, Murphy, Rust, van Appledorn, Williams
Individual lessons. Minimum of 12 hours of practice per week.
- 8-890.* PROBLEMS IN MUSIC EDUCATION.** (Cr ar [may be repeated for a maximum of 9 cr]; prereq consent of major adviser) A Anderson, Coffman, Downs, Ermey, Ferreira, Gauger, Murphy, Rust, van Appledorn, Williams
Directed projects in the theoretical and practical problems of teaching music in the schools.

PERSONAL ORIENTATION (PO)

(Psychology Department)

COURSES

- 1-001. HOW TO STUDY.** (1-3 cr)
To help the student gain a better understanding of himself and his academic and social environment; to study the topics of learning and motivation; to obtain practical assistance in developing efficient study habits and techniques and in improving reading comprehension skills.
- 1-002. THE STUDY OF HUMAN DEVELOPMENT.** (Cr ar [maximum of 3])
Human behavior as related to the psychological, social, and cultural development of the individual; factors in the student's environment which influence his personal adjustment; the origin and development of behavior, an analysis of human motives, the place of emotion and conflict in human adjustment, how man learns from his environment. A portion of the course may be devoted to the maintenance of students' reading and study skills.

PHILOSOPHY (Phil)

Advisers—Professor Ehlers; Associate Professor Evans; Assistant Professors Brenkert, Mayo

Honors Program—Candidates must be philosophy majors with a grade point average of 3.25 in all philosophy courses. Phil 5-990 is required, plus a substantial paper in either Phil 5-990 or another philosophy course. Comprehen-

sive examination is required in the history of philosophy and a special area. See department head for further details.

MAJOR IN PHILOSOPHY FOR B.A. DEGREE

Phil 1-001—Introduction to Philosophy (4)

Phil 1-005—Logic and Scientific Method (5)

Select from the following: Phil 3-110, 3-112, 3-114, 5-011, 5-012, 5-013, 5-014 (20)

Electives in philosophy (11)

Total (40)

MINOR IN PHILOSOPHY FOR B.A. OR B.S. DEGREE

Select from the following: Phil 3-110, 3-112, 3-114, 5-011, 5-012, 5-013, 5-014 (16)

Electives in philosophy (8)

Total (24)

COURSES

1-001. INTRODUCTION TO PHILOSOPHY. (4 cr, §1-010)

The nature of philosophy and philosophical method is illustrated through the treatment of such philosophical problems as free will, the relation of mind to body, the existence of God, and the choice between alternative world views.

1-003. ETHICS AND SOCIETY. (4 cr, §1-030, §1-070)

An examination of the presuppositions of man's moral reasoning. A study of ethical theories, and their relation to religion, to democracy, and/or to science.

1-005. LOGIC AND SCIENTIFIC METHOD. (5 cr, §1-050; prereq # for fr)

Study of definition, classification, argument, proof; relation of logic to language and to scientific method; introduction to symbolic logic.

3-004. WESTERN INTELLECTUAL HISTORY. (5 cr, §3-011, §3-012, §3-013, §5-011, §5-012, §5-013, §5-014)

A survey of Western thought from Homer to the present age, restricted to upper-classmen not majoring or minoring in philosophy.

3-110. AMERICAN PHILOSOPHY. (4 cr, §3-100)

General characteristics of American philosophy, with special emphasis on the period since 1870, including Peirce, James, Royce, and Dewey.

3-112. EXISTENTIALISM AND PHENOMENOLOGY. (4 cr, §1-140)

Emphasis on 20th-century continental philosophy, e.g., Sartre, Husserl, Heidegger, Buber, Merleau-Ponty, Camus.

3-114. LOGICAL EMPIRICISM AND ANALYSIS. (4 cr, §3-120; prereq 1-005 or #; offered 1972-73 and alt yrs)

The empiricist tradition in the 20th century. Russell and Wittgenstein; positivism and ordinary language philosophy.

3-116. CONTEMPORARY STUDIES. (3 cr [may be repeated for a maximum of 6 cr], §3-130; prereq 3-114 or #)

Detailed examination of some current issue or position in epistemology or metaphysics.

3-280. ETHICAL THEORY. (3 cr; prereq 1-001 or 1-003 or #; offered 1973-74 and alt yrs)

Characteristics and criteria of value statements; the justification of moral standards; examination of some 20th-century ethical theories.

3-421. ORIENTAL PHILOSOPHIES. (4 cr, §3-420; prereq 5 cr in philosophy or #; offered 1973-74 and alt yrs)

A nontechnical overview of Hinduism, Buddhism, Confucianism, and Taoism.

3-651. SYMBOLIC LOGIC. (4 cr, §3-650; prereq 1-005, or Math 1-286, or Math 1-283, or Math 3-030 or #; offered 1973-74 and alt yrs)

Dimensions of language; relation of logic to ordinary language, and to mathematics; calculus of propositions, classes and relations; properties of formal deductive systems.

Section 2—Major-Minor Requirements and Courses

- 5-011, 5-012, 5-013, 5-014. HISTORY OF PHILOSOPHY.** (4 cr each, §3-011 for 5-011, §3-012 for 5-012, §3-013 for 5-013; prereq 8 cr in philosophy; 5-012 offered 1972-73 and alt yrs...5-014 offered 1973-74 and alt yrs)
5-011: Ancient Greek philosophy, with emphasis on Plato and Aristotle. 5-012: Medieval and Renaissance philosophy, from Augustine to Descartes. 5-013: From Descartes to Kant. 5-014: From Kant to Nietzsche. Research paper required of graduate students.
- 5-200. AESTHETICS.** (3 cr, §3-200; offered 1972-73 and alt yrs)
The possibility of a definition of art or of the aesthetic experience is examined through a survey of classic aestheticians; attention is given to the philosophy of art criticism. Research paper required of graduate students.
- 5-540. PHILOSOPHY OF NATURAL SCIENCE.** (4 cr, §3-500; prereq 1-005 or §; offered 1973-74 and alt yrs)
Basic concepts and presuppositions of science; the problem of induction; theory construction, explanation, prediction. Research paper required of graduate students.
- 5-550. PHILOSOPHY OF SOCIAL SCIENCE.** (3 cr, §3-550; prereq 1-001, 5-540 or §; offered 1972-73 and alt yrs)
Types of explanation in the social sciences; value judgments, concept formation, problems in philosophical psychology. Research paper required of graduate students.
- 5-990. INDEPENDENT STUDY.** (1-4 cr [may be repeated for a maximum of 8 cr], §3-990; prereq jr or §)
Tutorial work in problems of special interest to the student, to be arranged with instructor in advance of registration. Students may take Phil 5-990 in conjunction with another philosophy course.

PHYSICAL EDUCATION (PE)

Advisers—Professors Rickert, Wells; Associate Professor J. Johnson; Assistant Professors Malosky, Ray, Richards, Rynda; Instructors Hall, Kirwin, Ladsten, Lundstrom, Mullen, Holland, Shercliffe, Roach

The Department of Physical Education offers programs leading to the bachelor or science degree with a major in physical education, minors in physical education for the elementary school and secondary education levels, a minor in recreation, and a minor in school health education. Coaching certification is offered for men and women desiring to qualify for coaching positions. Opportunities are available to all students for the development of a variety of skills and interests in many activities through participation in classes, intramurals, CWS recreation, and varsity sports. Specific courses are provided to meet the needs of students preparing for teaching in the elementary school.

MAJOR IN PHYSICAL EDUCATION FOR THE B.S. DEGREE

Recommended for students intending to seek teacher certification.

The major in physical education leading to the B.S. degree may be achieved by students who successfully complete the following curriculum. This major is planned to prepare graduates for responsible positions in elementary and secondary schools and to meet the teacher certification standards of the state of Minnesota.

Program for Men

ACTIVITY COURSES

PE 1-027^{oo}; 1-028^{oo}; 1-057^{ooo}; 1-306; 1-522; 1-523; 1-556; 1-620; 1-640; 1-652

Total Activity Credits (11)

^{oo} Or other courses in dance as approved by the department.

^{ooo} Or other "outdoor" activity courses (i.e. fishing, small craft, etc.)

THEORY COURSES

PE 3-100; 3-111; 3-113; 3-116; 3-141; 3-150; 3-160; 3-327; 3-328; 3-332; 5-170; plus one course from PE 3-272 or 3-273; plus 4 credits from PE 3-171; 3-173; 3-174; 3-175

Total Theory Credits (39-40)

ELECTIVE COURSES

Select 8-9 credits from the following: PE 3-049; 3-115; 3-116; 3-130; 3-149; 3-171; 3-326; 3-333; 3-361; 3-362; 3-363; 5-151

Total Elective Credits (8-9)

Total Credits (59)

REQUIRED SUPPORTING COURSES

Biol 1-011; 1-041; 1-105; 1-106; Phys 1-001**; Chem 1-101**; Soc 1-100 or Anth 1-602 or Anth 1-604; Hlth 1-500; PE 3-101

Program for Women

ACTIVITY COURSES

PE 1-046; 1-124; 1-510; 1-514; plus 2 credits to be selected from each of the following areas: individual sports, team sports, self-testing activities, and dance; plus 7 elective credits in activity courses.

Total Activity Credits (21)

THEORY COURSES

PE 1-650; 3-100; 3-111; 3-113; 3-141; 3-150; 3-160; 3-327; 3-328; 3-332; 5-170; plus 4 credits from the following: PE 1-325; 1-425; 3-321; 3-333; 3-334; plus 3 credits from alternate courses in PE 3-300 series not previously chosen; PE 3-149; 3-115; 3-116; 3-130; 3-149; 3-171; 3-326; 3-361; 3-362; 3-363; 5-151

Total Theory Credits (38)

Total Credits (59)

REQUIRED SUPPORTING COURSES

Biol 1-011; 1-041; 1-105; 1-106; Phys 1-001**; Chem 1-101**; Soc 1-100 or Anth 1-602 or Anth 1-604; Hlth 1-500; PE 3-101

MINOR IN PHYSICAL EDUCATION FOR THE B.S. DEGREE

This minor is designed for students working for a teaching certificate in another major field.

Program for Men

ACTIVITY AND THEORY COURSES

PE 1-027***; 1-174 or 1-652; 1-522 or 1-620; 3-111 or 3-116; 3-328; Hlth 1-500; plus any two of the following: PE 3-149; 3-173; 3-174; 3-326; 3-332 (16-18 cr)

ELECTIVE ACTIVITY AND THEORY COURSES

2 credits in courses numbered between PE 1-000 and 1-999; plus courses numbered PE 3-000 or above to bring total to 30 credits

Total Credits (30)

REQUIRED SUPPORTING COURSES

Biol 1-011 or 1-041

** Not required if taken in high school with a grade of C or better.

*** Or another course in dance as approved by the department.

Program for Women

ACTIVITY AND THEORY COURSES

PE 1-510; 1-514; 3-111 or 3-116; 3-328; Hlth 1-500; plus any 8-9 credits from the following: PE 1-325; 1-425; 3-149; 3-321; 3-326; 3-332; 3-333; 3-334 (18-20 cr)

ELECTIVE ACTIVITY AND THEORY COURSES

7 credits in courses numbered between PE 1-000 and 1-999 as approved by the department; plus courses numbered PE 3-000 or above to bring total to 30 credits

Total Credits (30)

REQUIRED SUPPORTING COURSES

Biol 1-011 or 1-041

MINOR IN PHYSICAL EDUCATION FOR MAJORS IN ELEMENTARY EDUCATION—B.S. DEGREE

ACTIVITY AND THEORY COURSES

PE 1-027*; 1-040; 1-060; 1-510; 3-326; 3-328; Hlth 1-500; plus one of the following: PE 3-111; 3-113; 3-115; 3-116; 5-121 (15-16 cr)

ELECTIVE ACTIVITY AND THEORY COURSES

6-8 credits in courses numbered between PE 1-000 and 1-999 as approved by the department; plus 6-8 credits in health or physical education courses numbered 3-000 and above.

Total Credits (30)

MINOR IN RECREATION

The minor in recreation is designed for preparation in recreational fields, particularly in public and institutional. The preparation consists of a background of theory, administration, and training in recreational skills.

For Students Pursuing a Major or Minor in Physical Education

REQUIRED COURSES

PE 3-361; 3-362; 3-363; Ind 1-401 (11 cr)

ELECTIVE COURSES

A minimum of 12 credits from the following courses as approved by the department: Ind 3-702; Art 1-002; 1-010; 1-400; 1-500; 3-810; 3-815; Mu 1-501; 1-502; 1-511; 1-512; 1-551; 3-597; SpTh 3-625; 3-665 (12 cr)

Total Credits (23)

For Students Not Pursuing a Major or Minor in Physical Education (B.A. and B.S. Degree)

REQUIRED COURSES

PE 3-361; 3-362; 3-363; Hlth 1-500; Ind 1-401 (12 cr)

ELECTIVE COURSES

8 credits in courses numbered between PE 1-000 and 1-999 as approved by the department; plus 6 credits in two of the following fields as approved by the department: industrial education, art, music, and speech.

Total Credits (26)

* Or any other dance course approved by the department.

COACHING CERTIFICATION

The coaching certification program is designed to prepare men to qualify for head coaching positions as per 1966 legislation and for women as per 1971 legislation.

Program for Men

REQUIRED ACTIVITY AND THEORY COURSES

PE 3-111 or 3-113; 3-116; 3-141; 5-170; Hlth 1-500; Biol 1-011; 1-041 (22 cr)

ELECTIVE ACTIVITY AND THEORY COURSES

7 credits selected from the following courses: PE 1-652; 3-170; 3-171; 3-173; 3-175 (7 cr)

Total Credits (29)

Program for Women

ELECTIVE ACTIVITY AND THEORY COURSES

PE 1-650; 3-116; 3-332 or 3-333 or 3-334; two of the following: PE 3-111, 3-113; or 3-115; Psy 3-321; plus 3 credits from any not selected above or: PE 1-014; 1-032; 1-038; 1-069; 1-073; 1-160; 1-167; 1-174; 1-207; 3-160

Total Credits (21)

Note—The State Board of Education will process all coaching certificates and they require, in addition to the above program that (a) a valid teaching certificate be held and (b) the coach be under contract with the local Board of Education.

COURSES

Liberal Education Activity Courses

A large variety of activity courses is offered as follows:

INDIVIDUAL AND DUAL SPORTS. (1 cr per qtr for each course)

Development of sports skills and understandings, with participation in the game.

- 1-032—Badminton
- 1-038—Tennis
- 1-040—Recreational Games
- 1-045—Fishing Skills
- 1-047—Beginning Archery
- 1-048—Bowling
- 1-050—Golf
- 1-057—Beginning Skiing
- 1-147—Intermediate Archery

TEAM SPORTS. (1 cr per qtr for each course)

Development of fundamental skills, strategies, and understandings in a team sport.

- 1-039—Wrestling
- 1-067—Basketball
- 1-069—Field Hockey
- 1-072—Soccer
- 1-073—Softball
- 1-074—Beginning Volleyball
- 1-075—Touch Football
- 1-167—Intermediate Basketball
- 1-174—Intermediate Volleyball

Section 2—Major-Minor Requirements and Courses

AQUATICS. (1 cr per qtr for each course)

Development of fundamentals and techniques; understandings of the principles of safety in or on the water.

- 1-003—Small Craft
- 1-004—Diving
- 1-007—Beginning Swimming
- 1-107—Intermediate Swimming
- 1-207—Advanced Swimming
- 1-306—Life Saving
- 1-308—Synchronized Swimming
- 1-409—Water Safety Instructor's Course (prereq Red Cross Life Saving Certificate)

ELEMENTARY EDUCATION MODULE. (4 cr per qtr)

Development of fundamental skills and a study of resource materials suitable for the elementary school program.

- 3-326—Pre-Adolescent Considerations

SELF-TESTING ACTIVITIES. (1 cr per qtr for each course)

Improvement of general physical condition and muscle control; development of individual skills and gymnastics routines.

- 1-014—Physical Fitness
- 1-046—Apparatus (prereq 1-060 or #)
- 1-046—Apparatus and Advanced Tumbling
- 1-059—Track and Field
- 1-060—Gymnastics, Stunts, Tumbling
- 1-061—Techniques of Relaxation (prereq Δ)
- 1-146—Intermediate Apparatus
- 1-160—Intermediate Gymnastics, Stunts, Tumbling

DANCE. (2 cr per qtr for 1-325 and 1-425; 1 cr per qtr for all other courses)

Mastery of basic dance steps and patterns in the social forms of dance; development of technical and choreographic skill for expressive communication through movement.

- 1-022—Ballroom Dance
- 1-024—Modern Dance
- 1-027—Folk Dance
- 1-028—Square Dance
- 1-124—Intermediate Modern Dance (prereq 1-024 or #)
- 1-127—Intermediate Folk Dance
- 1-325—Elements of Dance Composition (prereq 1-024 or #)
- 1-425—Dance Composition in Basic Forms (prereq 1-325 and 1-124 or ¶1-124)

Courses For Majors, Minors, and Coaching Certification

These courses, though primarily designed for fulfilling the major and minor in physical education, may also be used as general education electives. 3-000 level courses and above should be taken by juniors and seniors only.

1-510, 1-514. MOVEMENT EDUCATION. (2 cr each)

An inquiry into the nature of movement, fundamental movement patterns and their application to sports, aquatics, dance, and body mechanics.

1-522. APPARATUS. (1 cr)

Trampoline, sidehorse, parallel bars, rings, ropes, horizontal bar.

1-523. PHYSICAL EDUCATION ACTIVITIES. (1 cr)

Calisthenics, mass activities, relays, gymnastic games.

1-556. INTRAMURAL SPORTS. (2 cr)

Fundamentals, rules; soccer; volleyball.

1-600. SWIMMING. (1 cr; prereq intermediate swimming ability)

1-620. GYMNASTICS. (1 cr)

Stunts, tumbling, pyramids.

- 1-640. WRESTLING.** (1 cr)
Fundamental skills, rules, strategy, safety, conditioning, and training activities.
- 1-650. OFFICIATING.** (1 cr; prereq 1-074, 1-167 or #)
Qualifications, ethics, and duties of officials; discussion and interpretation of rules; practice in officiating under supervision; opportunities to obtain official ratings.
- 1-652. BASKETBALL FUNDAMENTALS.** (1 cr)
Demonstration and practice in footwork, passing, dribbling, shooting, defense, and individual skills.
- 3-100. ADAPTED PHYSICAL EDUCATION.** (3 cr; prereq Biol 1-011, Biol 1-041)
Special physical education for the mentally, physically, and socially handicapped; corrective physical education for body mechanics; developmental physical education for physical fitness.
- 3-111. KINESIOLOGY.** (3 cr; prereq Biol 1-011, Biol 1-041)
Application of the principles of mechanics and muscle action to the analysis of skill in basic human movement.
- 3-113. MOTOR LEARNING.** (3 cr; prereq Psy 1-003)
Factors affecting motor learning; theories of learning and their application to physical education; motor learning at beginning and advanced skill levels; measurement of learning and performance.
- 3-115. PHYSIOLOGICAL APPLICATION TO SPORTS.** (3 cr; prereq Biol 1-041)
Consideration of muscular contraction for strength development program; contributions of training programs to endurance, speed and skill acquisition; influence of training on the cardiovascular system; fatigue and recovery; early season training, pregame meals, and ergogenic aids in athletics.
- 3-116. APPLIED SPORTS SCIENCE.** (4 cr; 3 hrs lect, 4½ hrs lab)
Study of prevention and care of injuries with special emphasis on sport training programs. Reconditioning and preconditioning regimens.
- 3-130. HISTORY OF PHYSICAL EDUCATION.** (3 cr)
Dominant cultural forces that have shaped and developed physical education from ancient to modern times; resulting roles in education; future projection based on present social problems and trends.
- 3-141. ORGANIZATION AND ADMINISTRATION.** (3 cr)
Problems of organizing and administering the school program in physical education including instruction, intramural activities, and interscholastic athletics; establishment of departmental policies; operation of physical education facilities.
- 3-149. OUTDOOR RECREATION.** (5 cr)
Introduction to the skills necessary for enjoyment of outdoor living, including the handling of small craft (particularly canoes), skills of wilderness living, camping theory and practice, the art of fishing.
- 3-150. TESTS AND MEASUREMENTS.** (3 cr)
Principles of test construction; use of measurements in physical education; survey of the best present tests and measurements together with practical experience in administering in class situations.
- 3-160. EXTRA CLASS PROGRAMS.** (2 cr; not open to fr)
Study of extra school programs and the guiding principles, policies, and practices in implementing such programs.
- 3-171. COACHING OF BASKETBALL.** (2 cr)
Fundamentals, styles of offense and defense, training suggestions.
- 3-173. FALL SPORTS PRACTICUM.** (4 cr)
Practice on the skills of coaching methods in, and officiating techniques concerning football.
- 3-174. SPRING SPORTS PRACTICUM.** (4 cr)
Practice in the techniques of and coaching strategies in baseball, softball, track, and field.
- 3-175. COACHING HOCKEY.** (2 cr)
Fundamental skills, systems of offense and defense, strategy and rules of the game, methods of organizing practices and handling men.
- 3-272. OFFICIATING WINTER SPORTS.** (2 cr)
Rules; play situations; duties of officials in basketball, swimming, hockey, volleyball, and skiing.

Section 2—Major-Minor Requirements and Courses

- 3-273. OFFICIATING SPRING SPORTS.** (1 cr)
Rules; play situations; duties of officials in baseball, track, and field; practical experience in officiating these sports.
- 3-321. DANCE THEORY AND TEACHING.** (2 cr; prereq 2 cr from 1-562, dance courses between 1-022 and 1-425 or #)
The history, philosophies, theories of dance forms; principles of choreography; methods and practices in teaching various aspects of the dance program.
- 3-326. PRE-ADOLESCENT CONSIDERATIONS.** (4)
Methods and techniques of the presentation of lead-up games, body mechanics and rhythms in the elementary school program, general program planning and evaluation of the curriculum peculiar to the elementary school level.
- 3-327. CURRICULUM AND METHODS.** (4 cr; prereq 3-113)
Principles of program planning and methods applied to physical education; evaluation of curriculum and materials; practice in planning for instruction.
- 3-328. OBSERVATION AND PARTICIPATION.** (2 cr)
Introduction to teaching techniques through directed observation and participation.
- 3-332. ADVANCED AQUATICS.** (4 cr; prereq 1-306)
In-depth coverage of all phases of teaching and learning swimming techniques. Practice and theory of aquatic art.
- 3-333. INDIVIDUAL SPORTS: THEORY-PRACTICE.** (4 cr)
Theoretical and practical approach to the learning and teaching of individual sports in general with special emphasis on tennis and golf.
- 3-334. TEAM SPORTS: THEORY-PRACTICE.** (4 cr; prereq 1-067 and 1-074, equiv proficiency or #; 1 hr lect, 4 hrs lab)
Analysis of the skills, strategies, teaching methods, and materials of team sports with practicum specifically designed for intermediate volleyball and basketball.
- 3-361. ADMINISTRATION OF PUBLIC RECREATION.** (3 cr; prereq jr)
Principles of administration of public recreation; policies and procedures relative to recreation programs, facilities, finance, personnel, business management, public relations, and legal aspects. Designated for all persons desiring preparation for service in public recreation and of value to persons interested in physical education, social, and welfare work.
- 3-362. RECREATIONAL LEADERSHIP.** (3 cr; prereq jr)
Problems of leadership involved in the organization and operation of recreational programs; experience in conducting recreation activities.
- 3-363. PRINCIPLES OF RECREATION.** (3 cr)
History of recreation, theories of recreation and play, program planning, recreation as a part of community life.
- 5-110. SUPERVISION OF PHYSICAL EDUCATION.** (3 cr)
Supervisory activities of the physical education teacher, including setting up a program, establishing rapport between the teacher and supervisor, and providing a program of in-service training for the physical education teacher.
- 5-120. ADVANCED KINESIOLOGY.** (3 cr; prereq undergrad course in kinesiology or #)
Techniques of kinesiological analysis of basic movements and skills in physical education; evaluation of pertinent research methods and devices; application to individual projects.
- 5-121. CONTRIBUTIONS OF BASIC SCIENCES.** (3 cr; prereq #)
Pertinent research in basic sciences; applications in selected areas.
- 5-151. CURRICULUM.** (3 cr)
For students without previous experience in curriculum; objectives, content, organization, evaluation, and trends.
- 5-160. TESTS AND MEASUREMENTS.** (3 cr; prereq Educ 5-305 or #)
Study of the construction and interpretation of evaluative procedures; place and limitation of measurement.
- 5-161. SCIENTIFIC INTERPRETATIONS.** (2 cr; prereq 3-150 or #)
Interpretation of current professional literature and statistical treatments in current research. Written test construction and item analysis.
- 5-170. PRINCIPLES OF PHYSICAL EDUCATION.** (3 cr; prereq 3-327)
Aims, scope, and biological aspects of physical education with special treatment of its place in education.

PHYSICS (Phys)

Advisers—Professors Hanson, Jordan; Associate Professors Kroening, D. Olson, Sydor; Assistant Professors Casserberg, Likely, Oakland

See Section 4 for master of science degree program in physics.

MAJOR IN PHYSICS FOR THE B.A. DEGREE

Recommended for students intending to seek teacher certification.

Phys 1-030/1-031—Introduction to Physics (8)	Phys 3-099—Seminar (1)
Phys 1-033—Introduction to Physics Laboratory (1)	Phys 5-101/5-102/5-103—Modern Physics (12)
Phys 3-060/3-061/3-062—Dynamics, Electricity, and Magnetism (13)	Electives in physics courses numbered 3-000 or above (14)
Phys 3-070—Physics Laboratory (1)	
Phys 3-085—Electrical Networks (4)	Total (54)

In addition, Chem 1-110/1-111 (General Chemistry) or equivalent is strongly recommended. Prerequisites for the B.A. major include mathematics courses through 3-380.

MAJOR IN PHYSICS FOR THE B.S. DEGREE

Recommended for students who wish to go on to graduate studies in physics.

Phys 1-030/1-031—Introduction to Physics (8)	Phys 5-101/5-102/5-103—Modern Physics (12)
Phys 1-033—Introduction to Physics Laboratory (1)	Phys 5-107—Thermal Physics (4)
Phys 3-060/3-061/3-062—Dynamics, Electricity, and Magnetism (13)	Phys 5-126—Theoretical Mechanics (3)
Phys 3-070—Physics Laboratory (1)	Phys 5-127—Mathematical Methods (3)
Phys 3-085—Electrical Networks (4)	Phys 5-128—Electromagnetic Theory (3)
Phys 3-099—Seminar (1)	Electives in physics courses numbered 3-000 or above (6)
	Total (59)

In addition, Chem 1-110/1-111 (General Chemistry) or equivalent is required. Prerequisites for the B.S. major include mathematics courses through 3-380.

MINOR IN PHYSICS FOR THE B.S. OR B.A. DEGREE

Phys 1-030/1-031—Introduction to Physics (8)	Phys 3-070—Physics Laboratory (1)
Phys 1-033—Introduction to Physics Laboratory (1)	Electives in physics courses numbered above 3-000 (7)
Phys 3-060/3-061/3-062—Dynamics, Electricity, and Magnetism (13)	Total (30)

COURSES

- 1-001/1-002, 1-003. ELEMENTARY PHYSICS.** (4 cr each; 3 hrs lect, 2 hrs lab)
Beginning physics for meeting minimum requirements in certain preprofessional fields and a general survey for those not planning to continue in the physical sciences. Phys 1-001 must be taken first; Phys 1-002 and Phys 1-003 can be taken in any order.
- 1-020. PHYSICS FOR ELEMENTARY EDUCATION.** (4 cr, §1-001; prereq elementary education major; 3 hrs lect, 2 hrs lab)
Subject-matter background for effective teaching at the elementary school level.

Section 2—Major-Minor Requirements and Courses

- 1-030/1-031. INTRODUCTION TO PHYSICS.** (4 cr each; primarily for science and engineering majors; prereq ¶Math 1-286 for 1-031 or #; 4 hrs lect)
An introduction to physics from Newton to now, the basic ideas of classical and modern physics.
- 1-033. INTRODUCTION TO PHYSICS LABORATORY.** (1 cr; prereq 1-030 or #; 2 hrs lab)
Experiments selected to involve a variety of interesting concepts. A companion course to 1-030/1-031.
- 1-037. APPLIED PHYSICS.** (5 cr; prereq 1-031 and 1-033; 4 hrs lect, 2 hrs lab)
Selected topics of applied physics primarily for pre-medical students and other students who need a terminal course to complete 1-year sequence of physics for their major requirement.
- 3-060/3-061/3-062. DYNAMICS, ELECTRICITY, AND MAGNETISM.** (5/4/4 cr; prereq ¶Math 3-288 for 3-060 and ¶Math 3-380 for 3-062; 4 hrs lect each, plus 1 hr rec for 3-060)
Dynamics, electricity, and magnetism, including relativity.
- 3-070. PHYSICS LABORATORY.** (1 cr; prereq ¶3-061 or #; 2 hrs lab)
Experiments selected to provide experience with both concepts and techniques in physics.
- 3-085. ELECTRICAL NETWORKS.** (4 cr; prereq 3-061 and ¶3-062 and ¶Math 3-380 or #; 3 hrs lect, 3 hrs lab)
DC networks, meters, bridge circuits, transients, AC circuits, phasors, resonance, power and impedance matching, filters, transformers, transmission lines.
- 3-098. PHYSICS TUTORIAL PROJECT.** (0 to 2 cr [may be repeated for a maximum of 4 cr, only 2 cr applicable toward physics major]; prereq 3-062 and Δ)
Tutoring students in 1- and 3-prefixed physics courses under supervision of a physics staff member.
- 3-099. SEMINAR.** (1 cr; prereq Δ)
Practice in the preparation and oral presentation of reports on articles from the literature or on senior research.
- 3-111. RESEARCH.** (Cr ar [may be repeated for a maximum of 4 cr])
- 5-092. OPTICS LABORATORY.** (2 cr; prereq ¶5-119; 4 hrs lab; offered when feasible)
Experiments in interference, diffraction, polarization, optical spectra, photon counting techniques.
- 5-093. MODERN PHYSICS LABORATORY.** (2 cr; prereq 3-062 and ¶5-101 or #; 4 hrs lab ar; offered when feasible)
Experiments in modern physics; microwaves, radioactivity, photoelectric effect, ionization of gases, and optical spectra.
- 5-094. ADVANCED LABORATORY.** (2 cr; prereq 3-062 or #; 4 hrs lab ar)
Experimental problems of special interest to the student. Project may extend over more than 1 quarter. Credit will be given during the quarter in which the project is completed.
- 5-101/5-102/5-103. MODERN PHYSICS.** (4 cr each; prereq 3-062; 4 hrs lect)
Selected topics in modern physics, including elements of quantum mechanics and applications.
- 5-107. THERMAL PHYSICS.** (4 cr; prereq ¶5-101; 4 hrs lect)
Elements of statistical physics, thermodynamics.
- 5-109. STATISTICAL PHYSICS.** (4 cr; prereq 5-107; 4 hrs lect)
Principles of statistical physics applied to equilibrium properties of classical and quantum systems.
- 5-119. OPTICS.** (4 cr; prereq 3-062 or #; 4 hrs lect)
Fundamentals of physical optics.
- 5-120. ELECTRONICS.** (4 cr; prereq 3-085; 3 hrs lect, 3 hrs lab; offered when feasible)
Electronic devices, amplifiers, special circuits common in research.
- 5-126. THEORETICAL MECHANICS.** (3 cr; prereq 3-062 and Math 3-380; 3 hrs lect)
Theoretical mechanics, including Lagrangians and Hamiltonians, symmetries and conservation laws, with examples from relativity and electrodynamics, and introducing relevant mathematics.
- 5-127. MATHEMATICAL METHODS.** (3 cr; prereq 5-126; 3 hrs lect)
Systematic development of mathematical techniques in mechanics and electromagnetic theory.

- 5-128. ELECTROMAGNETIC THEORY.** (3 cr; prereq 5-127; 3 hrs lect)
Electric and magnetic fields, Maxwell's equations and applications, radiation.
- 5-130. INTRODUCTION TO ATMOSPHERIC PHYSICS.** (3 cr; prereq 5-128; 3 hrs lect; offered when feasible)
Atmospheric composition and structure; thermodynamics; radiative transfer; atmospheric electricity; chemistry; origin of the earth's atmosphere.
- 5-150/5-151. INTRODUCTION TO SOLID STATE PHYSICS.** (3 cr each; prereq 5-103 and 5-107; 3 hrs lect; offered when feasible)
Solid structure, thermal and electronic properties of solids, and solid surfaces.
- 5-160. ATOMIC AND MOLECULAR STRUCTURE.** (3 cr; prereq 5-103 or #; 3 hrs lect; offered when feasible)
Fine and hyperfine structure of atoms and molecules, selection rules and transition probabilities, coupling schemes, and potential curves.
- 5-175/5-176. ELECTRODYNAMICS.** (3 cr each; prereq 5-128 or #; 3 hrs lect)
Boundary-value problems, Maxwell's equations, covariant formulation of electrodynamics, radiation, relativistic particle motion.
- 5-180/5-181/5-182. INTRODUCTORY QUANTUM MECHANICS.** (3 cr each; prereq 5-103 and 5-128; 3 hrs lect)
Schrodinger equation, operator formulation, angular momentum, symmetries, perturbation theory, scattering, identical particles, interaction with electromagnetic field.
- 5-185. RELATIVISTIC QUANTUM MECHANICS.** (3 cr; prereq 5-182; 3 hrs lect; offered when feasible)
The Poincare group and relativistic one-particle quantum mechanics, elementary quantum field theory, electromagnetic interactions.
- 5-187. PARTICLE PHYSICS.** (3 cr; prereq 5-185; 3 hrs lect; offered when feasible)
Properties of elementary particles, conservation laws and symmetry groups, strong and weak interactions.
- 8-199. SEMINAR: SELECTED TOPICS.** (Cr ar [may be repeated for cr]; prereq #)
- 8-200. RESEARCH IN PHYSICS.** (Cr ar [may be repeated for cr])

POLITICAL SCIENCE (PoI)

Advisers—Professors Lease, von Glahn, Wolff; Associate Professor Olsen; Assistant Professors Fattu, Grau; Instructor Kress

MAJOR IN POLITICAL SCIENCE FOR THE B.A. DEGREE

PREREQUISITES

- Pol 1-010 (5)
- Pol 1-050 (4)
- Pol 1-100 (4)

MAJOR SEQUENCE, JUNIOR AND SENIOR YEARS

- A. Completion of at least 36 credits in Upper Division courses in political science (courses numbered 3-000 or above).
- B. Of this minimum of 36 credits in Upper Division courses not more than 16 credits may be in one area of concentration and not more than 28 credits may be in any two areas of concentration (the Upper Division courses which follow are grouped by areas of concentration: American governmental systems and processes; comparative government, international law, international relations; and political theory).
- C. Each major must, *in addition*, take one of the 3-credit seminars; the seminar experience will include a research paper and will thereby replace the former requirement of a noncredit major paper.

Total (52)

Graduate Study Recommendation—The department strongly recommends that majors in political science anticipating eventual graduate training in this field take a year of college-level mathematics and 2 years (or demonstration of equivalent proficiency) in a modern foreign language.

MINOR IN POLITICAL SCIENCE FOR THE B.A. OR B.S. DEGREE

29 credits in political science courses, including Pol 1-010 and at least 24 credits in courses numbered 3-000 or above. The Upper Division courses must be taken in at least two of the areas of concentration listed under the requirements for the major in political science, with not less than 8 credits in any one area of concentration.

Total (29)

Candidates for teacher certification enrolled in the political science minor program must practice teach in courses related to the area of political science (civics, modern problems, problems of democracy, etc.) before being recommended for certification in this area.

COURSES

- 1-010. AMERICAN GOVERNMENT AND POLITICS.** (5 cr, §1-001/1-002, §3-021)
Principles of American government: national, state, local. Survey of American governmental systems, structures, operations, and services; constitutionalism, federalism, civil liberties, parties, pressure groups, and elections.
- 1-050. INTERNATIONAL RELATIONS.** (4 cr, §1-025)
Introduction to contemporary international politics; nationalism; imperialism; nature of state power; international organization.
- 1-100. INTRODUCTION TO POLITICAL SCIENCE.** (4 cr, §1-105; prereq soph, others by # only)
Elements common to the political activities of human societies; basic concepts of political science; survey of major areas of the discipline. Recommended as an introduction to Upper Division courses in political science.

American Governmental Systems and Processes

- 3-020. STATE GOVERNMENT.** (4 cr, §3-021; prereq 1-010)
The states in the American federal system; governmental institutions and processes; intergovernmental relations. Special reference to Minnesota.
- 3-030. URBAN GOVERNMENT AND POLITICS.** (4 cr, §3-031; prereq 1-010)
Legal, administrative, political, and social aspects of American local government; emphasis on intergovernmental relations and regional cooperation.
- 3-060. NATIONAL POLICY ISSUES.** (4 cr, §3-051; prereq 1-010 or #)
Critical issues of contemporary national government: finance; foreign and military policy decisions; protection of civil rights; government and business; government and labor; agriculture and resource policies.
- 3-080. GOVERNMENT AND CONSERVATION.** (4 cr, §3-081; prereq 1-010 or #)
American natural resource problems with special attention to conservation activities on the national, state, and local levels; development of conservation agencies in Minnesota.
- 3-089. CONSERVATION PROBLEMS.** (3 cr; prereq 3-080 or #)
Detailed examination of crucial contemporary American resource problems; analysis of environmental preservation concepts and their implications; appraisal of specific situations.
- 3-099. SEMINAR: GOVERNMENT PROCESSES (U.S.).** (3 cr; prereq sr, 9 cr in relevant Upper Division political science courses and #; offered when feasible)
Supervised research and writing in American governmental systems and processes.
- 3-110. AMERICAN CONSTITUTIONAL LAW I.** (4 cr, §3-101, §3-102; prereq 1-010)
Nature of constitutional law; judicial review; national-state and interstate relations; powers of the national government.
- 3-111. AMERICAN CONSTITUTIONAL LAW II.** (4 cr, §3-102, §3-103; prereq 3-110 or #)
Constitutional rights; due process; equal protection of the laws.
- 3-160. THE LEGISLATIVE PROCESS.** (4 cr, §3-151; prereq 1-010)
Lawmaking in the United States on federal and state levels; social and economic forces involved in legislative enactments.

- 3-210. PUBLIC ADMINISTRATION I.** (5 cr, §3-201; prereq 1-010)
Introduction to public administration in the United States; administrative agencies in the political process, with emphasis on federal and state agencies concerned with environmental policies; processes related to agency goal achievement and survival; relationships with chief executives, legislatures, courts, other agencies, and interested publics.
- 3-211. PUBLIC ADMINISTRATION II.** (4 cr, §3-203; prereq 3-210)
Procedures and problems in budgeting. Focus on formal budgeting in agencies, on techniques of analysis and their implications—PPBS, cost-benefit, the reality of the budget process; the politics of budgeting; the budgetary process in specific federal and state agencies.
- 3-310. PUBLIC OPINION AND PROPAGANDA.** (4 cr, §3-301; prereq jr and 1-010 or #)
Use of public opinion and propaganda techniques by pressure groups and political parties; nature of persuasion; determination of public opinion.
- 3-399. SEMINAR: URBAN AFFAIRS.** (3 cr; prereq sr, 9 cr in relevant Upper Division courses in urban studies and #; offered when feasible)
Supervised research and writing in urban processes and problems.
- 3-702. FIELD WORK IN GOVERNMENT.** (1-3 cr [may be repeated for a maximum of 6 cr]; prereq jr and #; offered when feasible)
Scheduled work assignments, with supervision, in government agencies, with political campaigns, or with candidates for public office.
- 3-705. INDEPENDENT STUDY.** (3 cr [may be repeated for a maximum of 6 cr]; prereq sr and #; offered when feasible)
Opportunity for advanced independent study and research.
- 3-711. GOVERNMENT AGENCY INTERNSHIP.** (4-9 cr [may be repeated for a maximum of 9 cr]; prereq jr, political science major, and #; offered when feasible)
Scheduled work assignments, with supervision, in governmental agencies, full-time or part-time employment basis.
- 5-170. POLITICAL INTEREST INDIVIDUALS AND GROUPS.** (4 cr; prereq jr and 5 cr in political science or 12 cr in social sciences or #) Grau
Role of interest groups and individuals who lobby government in order to have an impact on public policy. Internal dynamics of groups; strategies of lobbying and its regulation.
- 5-320. THE AMERICAN CHIEF EXECUTIVE.** (3 cr, §5-307; prereq 1-010 and #; offered in 1972-73 and alt yrs) Lease
Constitutional powers and political roles of the President and governors; the chief executive and administration; executive relations with legislatures; party and popular leadership; presidential roles in crisis.
- 5-330. THE JUDICIAL PROCESS.** (4 cr, §5-309; prereq 1-010 or #; offered 1973-74 and alt yrs) Lease
Structure of the American judiciary; selection of judges; the process of litigation; influences on judicial decisions; impact of and compliance with decisions.
- 5-340. METROPOLITAN GOVERNMENT AND POLITICS.** (4 cr, §5-318; prereq 3-030) Olsen
Development of political and governmental problems in metropolitan areas; systems and structures for area-wide local government; emerging trends, potentials, and limitations for metropolitan government in the United States and elsewhere; politics of metropolitan reform.
- 5-740. AMERICAN POLITICAL PARTIES.** (4 cr, §5-737; prereq 1-010) Wolff
Role and functions of the party in American government; party composition and organization; process of nomination and policy formulation; regulation of party organization and activities.

Comparative Government, International Law, International Relations

- 3-410/3-411†. INTERNATIONAL LAW I, II.** (4 cr each, §3-401/3-402; prereq 9 cr in political science or #)
3-410: Introduction to international law; nature and sources; legal personality; nationality. 3-411: Territorial questions; diplomatic and consular agents; treaties; peaceful settlement of disputes.
- 3-412. INTERNATIONAL LAW III.** (3 cr, §3-404; prereq 1-050 or 3-411 or #)
Coercive self-help short of war; law of war; military occupation; war crimes.

Section 2—Major-Minor Requirements and Courses

- 3-450. PROBLEMS OF WORLD POLITICS.** (4 cr, §3-451; prereq 1-050 or #; offered 1973-74 and alt yrs)
Detailed analysis of selected current international problems and of solutions proposed.
- 3-499. SEMINAR: INTERNATIONAL RELATIONS.** (3 cr; prereq sr, 9 cr in relevant Upper Division political science courses and #; offered when feasible)
Supervised research and writing in current problem areas of international relations.
- 3-510. GOVERNMENT, POLITICS OF SOVIET UNION.** (4 cr, §3-501; prereq jr and 12 cr in social sciences or #)
Rise of Bolshevism and the Russian Revolution; ideology and development of Communist regime; political leadership; organization and uses of political power in the Soviet Union.
- 3-512. SOVIET POLICIES AND PROBLEMS.** (4 cr, §3-521; prereq jr and 3-510 or #; offered when feasible)
Current Soviet domestic policies; problems of political, economic, and social development; Soviet interest groups; political opposition and dissent; the Soviet vision of the Communist utopia.
- 3-514. SOVIET FOREIGN POLICY.** (3 cr, §3-431; prereq jr, 1-050 or #)
Factors conditioning Soviet foreign policy; Stalinism and the Comintern/Cominform; Sino-Soviet rift and intra-bloc relations; the Soviet commonwealth; Soviet and bloc relations with the West and the developing countries.
- 3-516. EUROPEAN GOVERNMENT AND POLITICS.** (5 cr, §3-505; prereq jr and 1-010 or 1-100)
Current governmental systems and politics of France, Germany, the United Kingdom, and Switzerland; comparative analysis of problems of political culture and democracy.
- 3-520. CHINESE GOVERNMENT AND POLITICS.** (4 cr, §3-507; prereq jr and 12 cr in social sciences or #)
Chinese political institutions and their development; ideologies; organization of political power; socioeconomic basis of political action.
- 3-599. SEMINAR: COMPARATIVE GOVERNMENT.** (3 cr; prereq sr, 9 cr in relevant Upper Division political science courses and #; offered when feasible)
Training in advanced analysis, with supervised research and writing, in selected areas of comparative government and politics.

Political Theory

- 5-650. AMERICAN POLITICAL THOUGHT.** (4 cr, §5-659; prereq 6 cr in political science or 12 cr in social sciences or #) Wolff
From colonial times to present; Puritanism; Constitution; Calhoun; social Darwinism; rise of Populist thought; development of legal theory; political thought and American literature.
- 5-652. POLITICAL THEORY AND UTOPIA.** (4 cr, §5-663; prereq 9 cr in social sciences or #) von Glahn
Selected great utopias; planning in ideal states; the problem of authority; radical and conservative utopias and dystopias; utopian literature, chiefly American.
- 5-653. CLASSICAL POLITICAL THOUGHT.** (4 cr, §5-664, §5-665; prereq 6 cr in political science or 12 cr in social sciences or #; offered when feasible) von Glahn
Classical Greek thought; Plato and Aristotle; primitive natural law; Cynics and Stoics; political theory in the Roman state; political thought in the medieval period.
- 5-655. EARLY MODERN POLITICAL THOUGHT.** (4 cr, §5-665, §5-666; prereq 6 cr in political science or 12 cr in social sciences or #; offered when feasible) von Glahn
Renaissance political thought, beginning with Machiavelli; idea of sovereignty; Protestant conceptions; English Civil War; Hobbes; Locke; the right to rebel; Montesquieu; Rousseau.
- 5-657. RECENT POLITICAL THOUGHT.** (4 cr, §5-667; prereq 6 cr in political science or 12 cr in social sciences or #) von Glahn
Main currents from French Revolution to present; Marxism and its critics; non-Marxist socialism; syndicalism; anarchism; conservatism; fascism; utopian socialism.

PSYCHOLOGY (Psy)

Advisers—Professors Gum, Kellogg, Tamminen; Associate Professors Bogen, Covner; Assistant Professors Das, Gindy, Smaby, Woolum; Instructors Falk, Hayes, Maddy

An undergraduate major in psychology provides a liberal arts education which may enable one to gain entry into a number of positions. However, most professional careers in psychology require some graduate work. Most graduate schools require approximately a B average for admission. Students considering graduate study are urged to consult with a member of the Psychology Department as early as possible.

Honors Program—Senior psychology majors who have a grade point average of 3.25 in psychology and 3.00 overall are eligible for honors work, and are encouraged to consult their advisers about the program. The program includes individual research (Psy 3-977) or an honors project (Psy 3-997) under the direction of a departmental honors committee selected in part by the student himself.

MAJOR IN PSYCHOLOGY FOR THE B.A. DEGREE

With rare exceptions, Psy 3-021/3-022 and 3-811 must be completed by the end of the junior year. Students planning to major in psychology are strongly urged to select courses, in consultation with the adviser, in fields supporting the psychology major and other courses which will facilitate attainment of their individual goals. A general outline of these recommendations will be supplied upon request in the departmental office or by mail.

MAJOR SEQUENCE IN PSYCHOLOGY

Psy 1-003—General Psychology (5)
 Psy 3-021/3-022—Experimental Design and
 Methodology (10)
 Psy 3-081—Systems of Psychology (3)
 Psy 3-811—Basic Statistical Methods (5)

Three courses from: Psy 3-041, 3-061, 3-101, 3-111, 3-201, 3-611, 3-821, PsyF 5-121

Psychology electives in Upper Division to complete 45 credits

Total (45)

MINOR IN PSYCHOLOGY FOR THE B.A. DEGREE

Psy 1-003—General Psychology (5)
 Psychology elective courses in Upper Division (19)

Total (24)

COURSES

Psychology (Psy)

1-003. GENERAL PSYCHOLOGY. (5 cr, §1-001/1-002)

Introduction to scientific study of behavior; consideration of the major topics investigated by psychologists with emphasis on basic principles, concepts, and procedures used in psychology.

1-211. TOPICS IN HUMAN SEXUALITY. (3 cr; prereq 1-003 or #)

Examination of constitutional and psychosocial factors leading to gender development and establishment of sexual roles; group discussion of family and peer group influences on attitudes, values, and behavior.

Section 2—Major-Minor Requirements and Courses

- 1-501. HUMAN DEVELOPMENT AND ADJUSTMENT.** (3 cr, §1-502; not open to jrs or srs)
Psychology of human development and processes of adjustment with emphasis on the healthy personality, adjustment in college, and for the young adult. Primary concern given to human relations, man and his environment, and the accomplishment of developmental tasks.
- 1-502. PERSONAL DEVELOPMENT, ORIENTATION TO LEARNING.** (5 cr, §1-501, §PO 1-001; not open to jrs or srs)
Examination of psychological principles as they relate to human growth and development in the adolescent–early adult years. In an experiential setting and with life-related discussion primary concern will be given to human relations, man and his environment, and the accomplishment of developmental tasks.
- 3-021/3-022. EXPERIMENTAL DESIGN AND METHODOLOGY.** (5 cr each; prereq 3-811 and §; 3 hrs lect, 2 hrs lab, 2 hrs ar)
Introduction to problems and methods of experimentation in psychology; the logical and scientific basis of experimental psychology; problems and techniques of designing, conducting, and reporting experiments; selected statistical topics and methods of psychological scaling; experimental procedures and research findings in areas of psychophysics, sensory processes, perception, learning, motivation, thinking, language, and group behavior.
- 3-041. MOTIVATION AND EMOTION.** (3 cr; prereq 3-021)
Situational, psychological, and physiological determinants of human and animal behavior; theories of motivation and emotion.
- 3-061. PHYSIOLOGICAL PSYCHOLOGY.** (3 cr; prereq 1-003 and Biol 1-105, Biol 1-106)
Physiological basis of behavior, including sensory processes, perception, emotion, motivation, intelligence, and learning.
- 3-081. SYSTEMS OF PSYCHOLOGY.** (3 cr; limited to sr psychology majors or by §; prereq 9 cr in psychology courses numbered 3-000 or above)
Survey of historical development and current status of contemporary systems and theories in psychology
- 3-101. DIFFERENTIAL PSYCHOLOGY.** (3 cr; prereq 3-821)
Quantitative studies of such factors as age, sex, race, and nationality, physical traits, family heredity, and environment in the causation of individual and group differences in such dimensions as achievement, aptitudes, interests, attitudes, and values.
- 3-111. PSYCHOLOGY OF PERSONALITY.** (3 cr; prereq 9 cr in Upper Division psychology courses)
Basic concepts, issues, problems, and methods involved in the study of personality; introduction to selected theories of personality.
- 3-201. SOCIAL PSYCHOLOGY.** (3 cr; prereq 1-003 and Soc 1-100)
Individuals as members of society; influence of social forces and interaction on personality development and attitudes. Study of group interactions and influences.
- 3-211. GROUP DYNAMICS.** (3 cr; prereq 3-201, sr status, and a 2.00 [C] average in psychology)
A laboratory in which the class group provides the material for the study of principles and processes of interaction in groups, structure, and functioning of groups; leadership, communication, social influence; aspects of sensitivity training.
- 3-311. CHILD DEVELOPMENT.** (3 cr, §3-331; prereq 1-003)
Introduction to child development with emphasis on basic processes involved in the development of physical and motor abilities, perceptual and cognitive functions, social and emotional behavior, and personality characteristics.
- 3-321. ADOLESCENT DEVELOPMENT.** (3 cr, §3-331; prereq 1-003)
Physical, intellectual, social, and emotional changes characterizing transition from childhood to adult life.
- 3-331. DEVELOPMENTAL PSYCHOLOGY.** (5 cr, §3-311, §3-321; prereq 1-003; non-majors only)
Major processes involved in human development from conception to death. Topics to include a survey of theoretical and methodological issues in the study of the individual, a comprehensive view of development during the period of most rapid growth, a perspective on problems arising at different stages of development by tracing their origin.
- 3-531. MENTAL HYGIENE.** (3 cr; not open to fr, soph; prereq 1-003)
Study of nature of the healthy personality, patterns of maladjustment, and extent of mental health problems. Consideration of the relationship between our culture and psychological adjustment.

- 3-611. LEARNING AND CONDITIONING.** (3 cr; limited to majors or minors in psychology or #: prereq 6 cr in psychology numbered 3-000 or above)
Basic principles of learning and conditioning; discussion of learning theories from historical, philosophical, and experimental aspects.
- 3-701. PSYCHOLOGY IN PERSONNEL WORK.** (3 cr; prereq 1-003)
Introduction to psychological contributions to modern personnel work, including testing, selection, merit rating, training, counseling, facilitating environments, and morale.
- 3-704. INDUSTRIAL AND BUSINESS PSYCHOLOGY.** (3 cr; prereq 1-003)
Factors affecting business and industrial work efficiency, including hours of work, safety, training, fatigue, and monotony; introduction to human engineering and an emphasis on contemporary concepts in the area of motivation. Introduction to selected theories related to motivation and organization.
- 3-811. BASIC STATISTICAL METHODS.** (5 cr; prereq 1-003 and 1½ yrs high school algebra or equiv)
Includes descriptive statistics, introduction to correlational analysis and regression, sampling techniques and statistical inference; applications of simple analysis of variance and chi square in the behavioral sciences.
- 3-821. PSYCHOLOGICAL MEASUREMENT.** (3 cr; prereq 3-811 or #)
Study of selection, preparation, administration, and interpretation of psychological tests and diagnostic devices, with emphasis on sources of tests of intelligence, aptitude, achievement, personality, and interest; criteria for their evaluation, methods of scoring, and interpretation; preliminary consideration of theories of reliability and validity of measurements.
- 3-960. SPECIAL TOPICS IN PSYCHOLOGY.** (Cr ar; prereq #)
- 3-970. RESEARCH IN PSYCHOLOGY.** (Cr ar [maximum of 6]; limited to majors and minors in psychology; prereq #)
Intensive independent research on problem chosen by student; term paper required.
- 3-977. HONORS RESEARCH IN PSYCHOLOGY.** (Cr ar [maximum of 3]; prereq sr major in psychology and approval by psychology faculty...3.00 GPA overall and 3.25 in psychology)
Individual research of a high order in selected areas; oral examination upon completion.
- 3-990. PROJECTS IN PSYCHOLOGY.** (Cr ar [maximum of 6]; limited to majors and minors in psychology; prereq #)
Supervised practical experience in university or community activities for the purpose of gaining experience in applications of psychology; report required.
- 3-997. HONORS PROJECTS IN PSYCHOLOGY.** (Cr ar [maximum of 3]; prereq sr major in psychology and approval by psychology faculty...3.00 GPA overall and 3.25 in psychology)
Individual projects of a high order demonstrating applications of psychology based on sound theoretical and research foundations; written report and oral examination.

Psychological Applications (PsyA)

- 5-711. OCCUPATIONAL INFORMATION LABORATORY.** (3 cr; prereq #) Falk
Using, reviewing, and evaluating occupational information. Consideration of career development and vocations, sources and types of material, occupational filing plans, and techniques for counselors and others concerned.
- 5-841. TESTS AND MEASUREMENTS.** (3 cr; prereq Educ 5-305 or PsyF 5-811) Covenner, Falk
Measuring intelligence, achievement, interests, attitudes, and personality traits; using measurement in educational guidance, personnel work, administration, and supervision.
- 8-500. SEMINAR: GUIDANCE.** (1 cr per qtr [may be repeated for a maximum of 6 cr]) Bogen, Gum, Tamminen
Integration of graduate study for Master's degree candidates in counseling and school guidance services. Examination of issues and developments in guidance; review of literature and research.
- 8-531. FIELD PRACTICE IN GUIDANCE.** (3 cr; prereq 5-211, 5-512, and #) Das, Gum, Smaby, Tamminen
Initial experience in guidance and counseling, observation of students, consultation with teachers and parents, and observation of ongoing guidance programs.

Section 2—Major-Minor Requirements and Courses

- 8-532. PRACTICUM: INDIVIDUAL COUNSELING.** (3 cr; prereq #)
Individual assignments in counseling under supervision, using closed-circuit TV, videotape, or audiotape.
- 8-541. PRACTICUM: GROUP COUNSELING.** (3 cr; prereq 8-532 and #)
Assignments in group counseling under supervision, using CCTV, videotape, audiotape.

Psychological Foundations (PsyF)

- 5-111. PERSONALITY AND ADJUSTMENT.** (3 cr; prereq 9 cr in education or #) Bogen, Das, Tamminen
Current conceptions of personality and adjustment, factors involved in adjustment, stresses of modern life, failures of adjustment, development of human effectiveness.
- 5-121. PSYCHOLOGY OF BEHAVIOR DISORDERS.** (4 cr; prereq Psy 1-003, Psy 3-531, or Psy 3-111 and #) Das, Tamminen
Study of abnormal behavior; concepts of normality and abnormality; types of abnormal behavior, their dynamics and treatment.
- 5-211. GROUP PROCEDURES IN GUIDANCE.** (3 cr; prereq grad, 5-511 or #) Gum
Problems of group work in guidance; study of group dynamics and group procedures; laboratory experience and materials for group guidance in school situations.
- 5-221. GROUP DYNAMICS IN EDUCATION.** (3 cr) Tamminen
Review of literature; practical application of social-psychological concepts to analysis of group behavior.
- 5-311. THEORIES OF CHILD DEVELOPMENT.** (3 cr; prereq E1Ed 3-101 or Psy 3-311 or #) Das, Smaby
An introduction to the neoanalytic, cognitive, and social learning theories of child development with special reference to the work of Erikson, Piaget, and Robert Sears.
- 5-312. CHILD DEVELOPMENT: RESEARCH, ISSUES.** (3 cr; prereq 5-311) Das
Critical evaluation of current research and issues in the areas of behavior genetics, early experience, cognitive development, socialization, and personality development.
- 5-321. ADOLESCENT PSYCHOLOGY.** (3 cr; prereq 12 cr in psychology, sociology, or home economics) Gum, Smaby
Physical, social, emotional, intellectual, and personality development of the adolescent.
- 5-511. PUPIL PERSONNEL SERVICES.** (3 cr; prereq 9 cr in psychology or education) Bogen, Gum, Smaby
Philosophy, principles, and practices in development and operation of pupil personnel services; role of counselor, teacher, principal, and specialized personnel; guidance techniques and case studies.
- 5-512. DEVELOPMENTAL GUIDANCE.** (4 cr; prereq 9 cr in psychology or #) Gum, Smaby
Developmental task theory and the tasks of the child, adolescent, and young adult. Application of the developmental task theory to guidance and learning situations.
- 5-521. COUNSELING PROCEDURES.** (3 cr; prereq 5-511, 5-811 and #) Bogen, Gum, Smaby
Introductory course in counseling for school and community personnel; basic theories and principles; counseling procedures, case studies, and role playing as they relate to counseling situations.
- 5-522. DYNAMICS OF INTERVIEWING.** (4 cr; prereq 12 cr in psychology or #) Smaby
Provides theory and practice opportunities for learning to interview effectively or improving interviewing skills.
- 5-611. PSYCHOLOGY OF HUMAN LEARNING.** (3 cr; prereq 12 cr in psychology or #) Smaby, Tamminen
Principles and research in human learning. Implications and applications for instruction and modifying behavior.
- 5-811. STATISTICAL METHODS IN EDUCATION.** (3 cr; prereq # and ¶5-821) Hayes
Descriptive statistics, introduction to correlational analysis and regression, sampling techniques and statistical inference; application of simple analysis of variance and chi square in educational research.
- 5-821. STATISTICAL METHODS LABORATORY.** (2 cr; prereq ¶5-811) Hayes

- 5-831. BASIC PRINCIPLES OF MEASUREMENT.** (3 cr; prereq 5-811 or #) Covner, Tamminen
Principles underlying construction and use of psychological tests; theory and practice of testing related to statistical methods; types and uses of derived scores; factors influencing reliability and validity.
- 8-041. METHODS IN EDUCATIONAL RESEARCH.** (3 cr; prereq candidate for M.A. degree, 5-811) Hayes
Methods and techniques in the design, execution, analysis, and reporting of educational research problems.
- 8-050.* RESEARCH PROBLEMS.** (1-9 cr; prereq #) Bogen, Gum, Tamminen
Independent study.

READING (Rdng)

(Special Education Department)

COURSES

- 0-001. READING AND STUDY STRATEGIES.** (No cr; 3 hrs lect/lab per wk)
Theory, techniques, and development of mature reading skills; emphasis upon vocabulary expansion, literal comprehension strategies, and reading rate.

RUSSIAN (Russ)

(Language Department)

COURSES

- 1-101/1-102/1-103. BEGINNING RUSSIAN.** (5 cr each; offered when feasible)
Grammar; reading; conversation.

SCIENCE (Sci)

Adviser—Professor McEwen

MINOR IN SCIENCE

The minor consists of a minimum of 35 credits in Science and Mathematics Division courses. Although the several options are designed specifically to meet the needs of majors in the Science and Mathematics Division, they are open to any major.

Option I. For Biology Majors

Chem 1-103/1-104—General Chemistry (10)
(or) Chem 1-110/1-111—General Chemistry (10)
Chem 1-500—Organic Chemistry (5)
(or) Chem 3-510/3-511—Organic Chemistry (8)
Math electives—5 to 15 credits selected from 1-110, 1-185, 1-286 or 1-283, 1-287 or 1-284, 3-288 or 3-285

Phys 1-001/1-002, 1-003—Elementary Physics (12)
(or) Phys 1-030/1-031—Introduction to Physics (8); Phys 1-033—Introduction to Physics Laboratory (1); Phys 1-037—Applied Physics (5)

Total (35 minimum)

Option II. For Chemistry Majors

Math 1-185—Pre-Calculus Analysis (5);
Math 1-286/1-287—Calculus I and II
(8); Math 3-288—Calculus III (4);
Math 3-320—Vectors and Matrices (4)

Phys 1-030/1-031—Introduction to Physics
(8); Phys 1-033—Introduction to Physics
Laboratory (1); Phys 1-037—Applied
Physics (5)

Total (35)

Option III. For Geology Majors

Chem 1-110/1-111—General Chemistry
(10)
Math 1-185—Pre-Calculus Analysis (5);
Math 1-286/1-287—Calculus I and II
(8); Math 3-501—Fortran Programming
(3)

Phys 1-030/1-031—Introduction to Physics
(8); Phys 1-033—Introduction to Physics
Laboratory (1)

Total (35)

Option IV. For Mathematics Majors

Chem 1-110/1-111—General Chemistry
(10)
(or) Chem 1-120/1-121—General Chemis-
try (10)

Phys 1-030/1-031—Introduction to Physics
(8); Phys 1-033—Introduction to Physics
Laboratory (1)

Courses in science or mathematics approved
by major adviser (15)

Total (34)

SOCIAL SCIENCE (SSci)

Advisers—Department Heads in Social Sciences

MAJOR IN SOCIAL SCIENCE FOR THE B.A. DEGREE

A student will plan his course of study in social sciences with an adviser and then must seek approval of that detailed program from the Social Science Degree Committee before being admitted to the Upper Division. The program must be oriented toward an educational goal which cannot be met within discipline-related majors, must include a minimum of 28 credits in Upper Division courses, and must include a majority of credits in courses within the social sciences (other credits may be selected from any disciplines).
Total (60)

MAJOR IN SOCIAL SCIENCE EDUCATION FOR THE B.S. DEGREE

Required for students intending to seek teacher certification.

Advisers—Department Heads of the Disciplines listed below

The following minimum core of subjects will be required of all candidates:

A. ECONOMICS

1-004—Principles of Economics: Micro (4)
1-005—Principles of Economics: Macro (4)
3-111—Microeconomic Analysis (5)
3-112—Macroeconomic Analysis (5)

Subtotal (18)

B. GEOGRAPHY

1-303—Cultural Geography (4)
1-312—Economic Geography (4)
1-403—Physical Geography (4)
3-571—Maps and Globes for Teachers (1)
One Upper Division topical geography
course (3-4)

Subtotal (16-17)

C. HISTORY

1-204, 1-205, 1-206—Civilization of the Modern World (12)

1-301, 1-302, 1-303—American History (12)

Subtotal (24)**D. POLITICAL SCIENCE**

1-010—American Government and Politics (5)

12 credits in Upper Division courses as approved by the head of Department of Political Science

Subtotal (17)**E. SOCIOLOGY****Option I****

1-100—Problems of American Society (5)

3-170—General Social Psychology (4)

3-190—Current Social Issues (4)

Anth 1-604—Cultural Anthropology (5)

Subtotal (18)**Option II*****

1-400—Social Inquiry I (5)

1-410—Social Inquiry II (5)

3-700—Social Psychology (4)

(or) 3-900—Social Issues and Social Change (4)

Anth 1-604—Cultural Anthropology (5)

Subtotal (19)**Total (93-95)****MINOR IN SOCIAL SCIENCE EDUCATION FOR THE B.S. DEGREE**

Permissible only for students majoring in elementary education.

Econ 1-004 and 1-005 (8)

Geog 1-303 and 1-403 (8)

Hist 1-301, 1-302, 1-303 (minimum of 8)

Pol 1-010 (5)

Soc 1-100 (5)

(or) Anth 1-604 (5)

Electives in social science courses numbered 3-000 or above in at least three different departments including geography and history

Total (46)**SOCIAL WORK (SW)**

The following social work courses offered by the School of Social Work-Duluth are available to undergraduate students at UMD. Included among these courses are courses required for students electing the social service concentration in the sociology-anthropology major. It is anticipated that the social service concentration will be replaced by a bachelor of social work degree offered by the School of Social Work-Duluth, in the near future. Students should consult the general bulletin of the School of Social Work-Duluth, forthcoming.

COURSES

1-109. HUMAN SERVICE LABORATORY. (3-6 cr [1-2 cr per qtr] with enrollment required for entire academic yr; prereq Psy 1-103, Soc 1-100)

First year: A supervised experience working in some area of the human services. Student may serve in big brother (or sister) role with a child, lead a small group, or other similar activity which enables him to experience a helping role in society. Small-group seminar conducted concurrently. *Second year:* Continue first year's service experience, placement in a different helping role, or serve as coordinator for a unit of first-year students, including seminar group leadership.

1-217. INTRODUCTION TO SOCIAL WORK METHODS I. (4 cr, §Soc 3-217; prereq Psy 1-103, Soc 1-100)

The values, goals, and methods of social work and how they are applied to pre-

** For students planning to teach general social science at the secondary school level.

*** For students planning to teach sociology at the secondary school level.

Section 2—Major-Minor Requirements and Courses

vention and intervention in various settings. An integrative approach to the helping process in social work for the prospective social work major or for the student preparing for related service professions.

- 1-300. INTRODUCTION TO CRIMINAL JUSTICE.** (4 cr, §Soc 1-300)
An analysis of the criminal justice system in the United States. Deals with the roles and relationships of agencies of crime and delinquency prevention, police, courts, and corrections. Content same as Soc 1-300.
- 3-201. DEVELOPMENT OF SOCIAL WELFARE.** (4 cr, §Soc 3-201; prereq Soc 1-100)
European background of American social welfare institution, influence of societal factors on development of philosophy and practice in American social welfare to the present.
- 3-205. CONTEMPORARY ISSUES IN AMERICAN SOCIAL WELFARE.** (3 cr, §Soc 3-205; prereq Soc 1-100)
Current philosophy, practice, and conflicts in American social welfare; relationship of governmental and voluntary services; basic issues currently being faced in the American social welfare institution.
- 3-302. CRIME AND DELINQUENCY.** (5 cr, §Soc 3-302; prereq 1-300 and Soc 1-100 or Soc 1-300)
The social-psychological examination of the nature, causes, and extent of criminal and delinquent behavior, its impact upon society, and the means society employs in its prevention and control. Content same as Soc 3-302.
- 3-306. PROBATION AND PAROLE.** (4 cr, §Soc 3-306; prereq 3-302 or Soc 3-302)
The goals and problems encountered in the field supervision of both delinquent juveniles and adult criminals. Field trip.
- 3-308. CORRECTIONAL INSTITUTIONS.** (4 cr, §Soc 3-308; prereq 3-302 or Soc 3-302)
The organization and administration of correctional institutions. Two-day field trip.
- 5-121. FIELD WORK AND PRACTICE SEMINAR.** (9-15 cr, §Soc 3-121; prereq social work sr major and #)
Supervised field work in a social service agency or organization. Small group practice seminar accompanies the field work placement.
- 5-125, 5-127, 5-129. SPECIAL TOPICS IN SOCIAL WORK.** (3 cr each [may be repeated for a maximum of 9 cr]; prereq social work jr or sr major or #; offered when feasible)
A proseminar on contemporary topics of concern to students and faculty. Specific course content will be announced in schedule of classes.
- 5-203. SOCIAL SERVICES IN THE UNITED STATES.** (5 cr, §Soc 3-203; prereq Soc 1-100)
Analysis of social services and social service delivery systems; social agencies, their purpose, organization, functional and dysfunctional aspects; introduction to social policy analysis.
- 5-219/5-221. SOCIAL WORK METHODS II AND III.** (4 cr each, §Soc 3-219/3-221; prereq 1-217, sr, social work major)
Analysis of social work methods to meet human needs. Introduction to the realities of social work practice and the relationships between social worker, agency, the client, and the community. Concepts of prevention and treatment and differential use of social work methods.
- 5-223. SENIOR SEMINAR IN SOCIAL WORK.** (3 cr; prereq sr, #)
Investigation, reporting, and discussion of a variety of specific areas in social work, focusing on particular practice and/or graduate school interests of students.
- 5-239. INDEPENDENT STUDY IN SOCIAL WORK.** (Cr ar [maximum of 5]; prereq social work jr or sr major and Δ)
Directed reading, research, or other experiences, leading to presentation of report.

SOCIOLOGY - ANTHROPOLOGY (Soc)

For anthropology see pages 51-52.

Advisers—Professors Baemler, Pearson; Associate Professors Brissett (School of Medicine—Duluth), Laundergan; Assistant Professors Campbell, Deming, Kuldau, Roufs; Instructors Fleischman, Franz, D. Smith
Most professional positions in sociology require some graduate work.

Students considering graduate study are urged to consult with a member of the Sociology-Anthropology Department as soon as possible.

There are six areas of concentration in sociology from which students may elect courses. Students may elect courses primarily from within an area of concentration or may elect a generalized program without concentration. The six areas of concentration are: community and social organization, social psychology, social issues and change, anthropology, criminology, and social work (see the preceding listing for social work courses). Required courses for a major or minor in sociology-anthropology are listed below:

MAJOR IN SOCIOLOGY—ANTHROPOLOGY FOR THE B.A. DEGREE

Soc 1-400—Social Inquiry I (5)
Soc 1-410—Social Inquiry II (5)
Soc 3-420—Development of Sociological
Theory (4)

Electives in sociology or anthropology**—
at least 23 of these credits must be in
courses numbered 3-000 or above

Total (46)

MINOR IN SOCIOLOGY—ANTHROPOLOGY FOR THE B.A. AND B.S. DEGREES

Soc 1-400—Social Inquiry I (5)
Soc 1-410—Social Inquiry II (5)
Soc 3-420—Development of Sociological
Theory (4)

Electives in sociology-anthropology—at
least 11 of these credits must be in
courses numbered 3-000 or above

Total (28)

CONCENTRATIONS

Anthropology Concentration

Advisers—Assistant Professor Roufs; Instructor D. Smith

The anthropology curriculum focuses on the development and diversity of man and serves (a) to provide a cross-cultural perspective supportive of other disciplines and areas of study, (b) to prepare students for further anthropological study in other institutions, (c) to prepare students for graduate study in anthropology or other social sciences, and (d) to provide a general understanding of man at different times and in different places. Special topics will be offered regularly to meet the interests of those in the anthropology concentration and to provide further background for those who wish to continue study in anthropology.

Community and Social Organization Concentration

Advisers—Professors Baeumler, Pearson; Associate Professor Laundergan; Instructor Fleischman

** Soc 1-100, Problems of American Society, may not be applied to a major. Soc 3-170, General Social Psychology, Soc 3-180, Community and Social Organization, and Soc 3-190, Current Social Issues, may not be taken by a declared sociology major for credit in the major. However, a student having taken these credits prior to enrolling in Soc 1-400 may petition to have these credits applied toward his major. Petition forms may be obtained in the Sociology-Anthropology Department office

The community and social organization concentration prepares a student for (a) graduate study in sociology with a community-social organization emphasis, (b) community action work, (c) paraprofessional research in community programs and social organizations. The student taking this concentration is urged to take supporting courses in political science, geography, anthropology, and other behavioral sciences.

Criminology Concentration

Advisers—Assistant Professors Deming, Kuldau

The criminology curriculum prepares students for (a) graduate study in preparation for academic and research careers in criminology, (b) law school and careers in criminal law, (c) careers in probation and parole work, and (d) careers in law enforcement. In addition, courses are offered as electives to those with career interests in education, sociology, social work, psychology, and the ministry.

Students may elect courses in the criminology curriculum that best prepare them for their selected careers. All students in the criminology concentration must take the required courses for a major in sociology. Certification on the transcript will be noted for those students who complete the requirements of this concentration. Consult the Sociology-Anthropology Department for course requirements.

Issues-Change Concentration

Advisers—Professor Baeumler; Associate Professor Laundergan; Assistant Professor Campbell; Instructor Franz

An analysis of social change and social issues as they affect social life with emphasis placed upon the use of sociological theory and research in comprehending the dynamics of social issues and socio-cultural change. Special attention is given to the identification of relevant issues through student and faculty consultation.

This course of study is designed to prepare students to (a) be aware of societal changes and issues, (b) better understand the causes and consequences of such changes and issues, and (c) identify areas of potential innovation as practitioners of planned change.

Social Psychology Concentration

Advisers—Associate Professor Brissett; Instructors Fleischman, Franz

The social psychology concentration focuses on the effects of society on the individual. A student taking this concentration receives preparation (a) to do graduate study in sociology and social psychology, (b) in support of teaching and service occupations, (c) in support of other sociology-anthropology concentrations.

Social Service Concentration

Advisers—School of Social Work—Duluth Faculty

The social service concentration prepares students (a) for practice in social welfare agencies, (b) for graduate professional education in social

work, (c) for more knowledgeable practice in other human service professions, and (d) for more informed citizen participation in social welfare activities in the community. Certification on the transcript will be noted for those students who complete the requirements of this concentration. Consult the Sociology-Anthropology Department office for course requirements.

While this concentration has been approved by the Council on Social Work Education, the School of Social Work-Duluth is currently in the process of developing a separate bachelor of social work degree program which will offer a more comprehensive program. It is uncertain when this new major will be instituted, but students should periodically consult with either the Sociology-Anthropology Department or the School of Social Work-Duluth for current information.

COURSES

- 1-100. PROBLEMS OF AMERICAN SOCIETY.** (5 cr [cr not allowed toward sociology-anthropology major or minor], §1-101, §1-105)
An application of the sociological perspective to social problems within the United States.
- 1-300. INTRODUCTION TO CRIMINAL JUSTICE.** (4 cr, §1-301, §SW 1-300)
An analysis of the criminal justice system in the United States. Deals with the roles and relationships of agencies of crime and delinquency prevention, police, courts, and corrections. Content same as SW 1-300.
- 1-400. SOCIAL INQUIRY I.** (5 cr, §1-101, §1-103, §3-402, §3-404; prereq major or #)
An approach to problem-solving using sociological concepts, research methods, and data analysis.
- 1-410. SOCIAL INQUIRY II.** (5 cr; prereq 1-400 or #)
An approach to problem-solving using sociological concepts, research methods, and data analysis.
- 3-120. INDEPENDENT STUDY IN SOCIOLOGY.** (Cr ar [maximum of 5 cr], §3-119; - prereq sociology major, jr or sr, Δ)
Directed reading, research, or involvement in social action leading to the preparation of a paper.
- 3-121. FIELD EXPERIENCE.** (Cr ar [maximum of 15 cr], §SW 5-121; prereq sociology major or minor and #)
A supervised laboratory experience in a human service agency or project. Content same as SW 5-121.
- 3-170. GENERAL SOCIAL PSYCHOLOGY.** (4 cr, §3-113; for nonmajors only; prereq 1-100 or #)
Explanation of behavior as a result of social system, individual and interaction variables. Attention is given to examples and issues useful for students majoring in areas other than sociology.
- 3-180. COMMUNITY AND SOCIAL ORGANIZATION.** (4 cr, §3-111; for nonmajors only; prereq 1-100 or #)
An examination of community and societal structures and processes with specific attention given to the functioning of voluntary associations and complex organizations.
- 3-190. CURRENT SOCIAL ISSUES.** (4 cr, §3-103; for nonmajors only; prereq 1-100 or #)
Application of sociological theory and research to current topics; analysis of community life, social movements, and social conditions.
- 3-302. CRIME AND DELINQUENCY.** (5 cr, §3-301, §3-303, §SW 3-302; prereq 1-100, 1-300)
The social-psychological examination of the nature, causes, and extent of criminal and delinquent behavior, its impact upon society, and the means society employs in its prevention and control. Content same as SW 3-302.
- 3-310. SOCIOLOGY OF CRIMINAL LAW.** (4 cr, §3-309; prereq 3-302)
The nature, goals, and problems of the administration of the American Criminal Judicial process.

Section 2—Major-Minor Requirements and Courses

- 3-312. POLICE ADMINISTRATION.** (4 cr, §3-311; prereq 3-302)
The nature, goals, and problems of the police agencies.
- 3-314. POLICE ROLE IN DELINQUENCY CONTROL.** (4 cr; prereq 3-302 and 3-312)
Exploration of the police role in juvenile delinquency prevention and control. Recommended for seniors in the law enforcement emphasis.
- 3-318. POLICE COMMUNITY RELATIONS.** (4 cr; prereq 3-302 and 3-312)
Exploration of the relationship of police and community with primary focus on police responsibility to the community, community responsibility to the police, and public relations procedures.
- 3-420. DEVELOPMENT OF SOCIOLOGICAL THEORY.** (4 cr, §3-117; prereq 1-410 or #)
Theoretical perspectives in sociology from early 19th century to the present; examination of several major theorists central to the development of the discipline.
- 3-700. SOCIAL PSYCHOLOGY.** (4 cr, §3-170; prereq 3-420 or #)
Theory and research issues regarding relation of individual to society. Emphasis on socialization, the effects of social organization and disorganization, and interpersonal interaction.
- 3-710. COLLECTIVE BEHAVIOR.** (4 cr; prereq 3-700 or #)
Examination of social movements as they lead to and result from social change. Specific focus on the role of the individual under conditions of social change.
- 3-720. ATTITUDE AND BEHAVIOR CHANGE.** (4 cr; prereq 3-700 or #)
Examination of research and theoretical issues connected with attitude and behavior change and resistance to change. Discussion of techniques for change and related moral issues.
- 3-730. SPECIAL TOPICS—SOCIAL PSYCHOLOGY.** (4 cr; prereq 3-700 or #)
An examination of social psychology topics identified through student-faculty consultation.
- 3-800. SOCIAL AND COMMUNITY ORGANIZATION.** (4 cr, §1-115, §3-109, §3-111, §3-180; prereq #)
The organization and structure of social systems as affected by demographic and ecological factors involved in community formation and development. The place of community within society will be examined. Cross-cultural studies may be included.
- 3-810. COMMUNITY ANALYSIS.** (4 cr, §3-109, §3-115; prereq 3-800 or #)
Intensive study of the structure and functioning of contemporary social systems as viewed from the sociological perspective in community context. Agricultural, rural nonagricultural, suburban, urban, and international communities will be examined.
- 3-820. COMMUNITY RESEARCH.** (4 cr; prereq #)
Supervised community research where faculty and students engage in actual study of selected northern Minnesota and northern Wisconsin communities.
- 3-830. COMMUNITY DEVELOPMENT.** (4 cr, §3-111; prereq 3-800 or #)
Procedures and practices of community organizing for the purpose of community problem-solving. An application of principles of community development.
- 3-840. SPECIAL TOPICS—ORGANIZATION.** (4 cr; prereq 3-800 or #)
An examination of specific community and social forms and processes identified through student-faculty consultation.
- 3-900. SOCIAL ISSUES AND SOCIAL CHANGE.** (4 cr, §3-190; prereq 3-420 or #)
An analysis of the forces of social change and social issues as they affect social life. Emphasis is placed upon the use of social theory and research in comprehending the dynamics of issues and change.
- 3-910, 3-920, 3-930. SPECIAL TOPICS—ISSUES AND CHANGE.** (4 cr each; prereq 3-900 or #)
An examination of social issues and changes identified through student-faculty consultation. Students and faculty in joint consultation will have the opportunity to select particular topics for a given course.
- 5-109. SOCIAL CULTURAL CHANGE.** (3 cr; prereq #)
Factors underlying social change in contemporary societies. Recent researches on social movement reform and revolution, culture contact, impact of rapid technological change. The individual in social structure under conditions of rapid social change.
- 5-111. THE FAMILY.** (3 cr; prereq #)
Evolution of the family: development of family unity or disunity, roles of the several members of the family, methods of investigation of the family.

- 5-113. ADVANCED SOCIAL PSYCHOLOGY.** (3 cr; prereq #)
Analysis of interpersonal behavior within a social context; major theoretical perspectives and current issues including motivation, socialization, group functioning, and behavioral consistency and change.
- 5-115. RURAL COMMUNITY ANALYSIS.** (3 cr; prereq #)
For prospective rural teachers, social workers, and extension workers; emphasis on methods of making field studies of communities.
- 5-117. RURAL SOCIAL INSTITUTIONS.** (3 cr; prereq #)
The structure, function, and change of rural social institutions in a rural environment diffused with contemporary technology and bureaucracy.
- 5-119. SOCIOLOGY OF EDUCATION.** (3 cr; prereq #)
Social structure of the school; the classroom as a social system; analysis of educational roles; impact of social classes on education; school and community power structure.
- 5-121. URBAN SOCIOLOGY.** (3 cr; prereq #)
Cities; urban ecology; urban institutions; and urban way of life.
- 5-124. ADVANCED SOCIOLOGICAL THEORY.** (3 cr; prereq 3-420 or #)
Examination in detail of the work of one social theorist; contemporary theoretical and practical implications of the selected theory.
- 5-125, 5-127, 5-129. SPECIAL TOPICS.** (3 cr each; prereq #; offered when feasible)
A proseminar on contemporary topics in sociology. Specific course content will be announced in schedule of classes.

SPANISH (Span)

(Language Department)

Advisers—Instructors Haladyna, Langr, Long

MAJOR IN SPANISH FOR THE B.A. DEGREE

- | | |
|--|---|
| Span 1-101/1-102/1-103—Beginning Spanish (15) | by examination or documentation from another institution |
| Span 1-201/1-202/1-203—Intermediate Spanish (9) | Plus 28 credit hours of Upper Division courses in Spanish; up to 8 credits may be from other departments directly relevant to the student's program |
| Span 3-121/3-122/3-123—Advanced Spanish (12) | |
| (or) A language competence equivalent to Span 3-123, which may be determined | Total (64) |

A student majoring in Spanish must pass an oral proficiency examination which should be taken while the student is enrolled in the "Advanced Spanish" sequence; the examination may be repeated.

MINOR IN SPANISH FOR THE B.A. DEGREE

- | | |
|---|--|
| Span 1-101/1-102/1-103—Beginning Spanish (15) | (or) A language competence equivalent to Span 3-123 which may be determined by examination or documentation from another institution |
| Span 1-201/1-202/1-203—Intermediate Spanish (9) | Plus 8 credit hours of Upper Division courses in Spanish |
| Span 3-121/3-122/3-123—Advanced Spanish (12) | |
| | Total (44) |

MAJOR IN SPANISH FOR THE B.S. DEGREE

Required for students intending to seek teacher certification.

- | | |
|---|---|
| Span 1-101/1-102/1-103—Beginning Spanish (15) | Span 1-201/1-202/1-203—Intermediate Spanish (9) |
|---|---|

Section 2—Major-Minor Requirements and Courses

Span 3-121/3-122/3-123—Advanced Spanish (12)

(or) A language competence equivalent to Span 3-123, which may be determined by examination or documentation from another institution

Lang 3-801—Teaching Nonnative Language (4)

A phonetics or linguistics course, such as SPA 1-990, Introduction to Phonetics (4); Engl 5-811, Introduction to Modern English (4); Span 3-152, Phonology, Morphology, and Syntax (4)

Plus 20 credit hours of Upper Division courses in Spanish; a maximum of 5 credits may be from other departments directly relevant to the student's program

Total (64)

A student majoring in Spanish must pass an oral proficiency examination which should be taken while the student is enrolled in the "Advanced Spanish" sequence; the examination may be repeated. The B.S. candidate must pass the examination before being permitted to student teach. All Spanish B.S. majors must student teach in Spanish for certification.

MINOR IN SPANISH FOR THE B.S. DEGREE

Required for students intending to seek teacher certification.

Span 1-101/1-102/1-103—Beginning Spanish (15)

Span 1-201/1-202/1-203—Intermediate Spanish (9)

Span 3-121/3-122/3-123—Advanced Spanish (12)

(or) A language competence equivalent to Span 3-123, which may be determined by examination or documentation from another institution

Lang 3-801—Teaching Nonnative Language (4)

A phonetics or linguistics course, such as SPA 1-990, Introduction to Phonetics (4); Engl 5-811, Introduction to Modern English (4); Span 3-152, Phonology, Morphology, and Syntax (4)

Total (44)

A student taking a B.S. minor in Spanish must pass an oral proficiency examination which should be taken while the student is enrolled in the "Advanced Spanish" sequence; the examination may be repeated. The candidate must pass the examination before being permitted to student teach. All Spanish B.S. minors must student teach in Spanish for certification.

COURSES

1-101/1-102/1-103. BEGINNING SPANISH. (5 cr each)

Grammar; reading; conversation.

1-111/1-112. BEGINNING SPANISH. (8 cr first term, 7 cr second term; offered summer only)

Grammar; reading; conversation. Covers the same material handled in the regular first-year sequence.

1-201/1-202/1-203. INTERMEDIATE SPANISH. (3 cr each; prereq 1-103)

Review of grammar. Improvement of proficiency in language skills.

1-211/1-212. INTERMEDIATE SPANISH. (5 cr first term, 4 cr second term; offered summer only)

Review of grammar. Improvement of proficiency skills. Covers the same material handled in the regular intermediate sequence.

3-121/3-122/3-123. ADVANCED SPANISH. (4 cr each, §3-101/3-102/3-103; prereq 1-203)

Composition; conversation; grammar; reading.

3-152. PHONOLOGY, MORPHOLOGY, AND SYNTAX. (4 cr, §3-151; offered 1972-73 and alt yrs)

Applied Spanish linguistics for the learner and teacher.

3-505. SPANISH POETRY. (4 cr, §3-501; prereq 1-203; offered 1973-74 and alt yrs)

3-511. LITERATURE IN TRANSLATION. (4 cr, §3-510; students may substitute Engl 3-511, Fr 3-511, or Ger 3-511 for Span 3-511 in selecting electives; offered 1973-74 and alt yrs)

Reading of Spanish literature in translation.

- 3-533. **CERVANTES IN TRANSLATION.** (4 cr, §3-531; offered 1973-74 and alt yrs)
A study of Cervantes' major work, *Don Quixote*.
- 3-534. **GOLDEN AGE LITERATURE.** (4 cr, §3-532; prereq 1-203; offered 1973-74 and alt yrs)
Picaresque novel, theater, and poetry of the "Golden Age."
- 3-550. **18TH- AND 19TH-CENTURY LITERATURE.** (4 cr; prereq 1-203; offered 1972-73 and alt yrs)
Prose and dramatic literature of the 18th and 19th centuries.
- 3-575. **MODERN SPANISH LITERATURE.** (4 cr; prereq 1-203; offered 1972-73 and alt yrs)
Peninsular prose and drama of the 20th century.
- 3-576. **MODERN LATIN-AMERICAN LITERATURE.** (4 cr; prereq 1-203; offered 1972-73 and alt yrs)
Poetry, prose, and drama of Latin America of the 20th century.
- 3-997. **SEMINAR.** (4 cr per qtr [may be repeated for a maximum of 8 cr], §3-998; prereq 1-203 and §)
The theory and practice of teaching basic nonnative language skills and cultural concepts at any educational level. Applicable also to teachers of English as a foreign language.
- Lang 3-801. **TEACHING NONNATIVE LANGUAGE.** (4 cr; prereq 24 cr of Spanish or §)
The theory and practice of teaching basic nonnative language skills and cultural concepts at any educational level. Applicable also to teachers of English as a foreign language.

SPEECH, COMMUNICATION, AND THEATER ARTS

Advisers—Associate Professors Huntley, Ness; Assistant Professor Katz; Instructors Schultz, Thornton

The Department of Speech, Communication, and Theater Arts provides curricular and cocurricular offerings in the areas of rhetoric/public address, communication, theater, and communication media.

It is the aim of the department to provide the student with concepts of effective and responsible communication.

The department offers a B.A. major and minor and a B.S. major and minor. The B.S. major and minor fulfill state certification requirements for secondary school teaching.

The following cocurricular activities are sponsored by the department:

Debate and Forensics—This program is meant to maximize the student's oral communication skills by two means. The first is through intercollegiate competition in debate and individual speaking events. The second is through a symposium program in which the student prepares for and addresses audiences throughout the community.

KUMD-FM—This facility is a student-operated educational radio station operating at an assigned frequency of 89.1 mc. Incorporating the philosophy of alternative programming, KUMD-FM values highly the challenge of creative public programming designed to meet both campus and community needs.

UMD Theater—The UMD Theater produces four main stage productions, including a musical and a children's theater, directed and designed by the theater faculty. Student-produced one-acts are performed in the Studio Theater in conjunction with theater courses. All UMD students, regardless of year in school and experience, are encouraged to participate in the acting and technical crews of all productions.

For further information concerning these activities, contact the department head.

MAJOR IN SPEECH, COMMUNICATION, AND THEATER ARTS FOR THE B.A. DEGREE

This major requires 45 credits including 27 credits in Upper Division courses and departmental approval.

A student will plan his course of study with an adviser and then must seek departmental approval of that program before completing 9 hours of courses. In the event that a student declares a major or minor after having already completed 9 hours of courses, he must seek immediate departmental approval of his program.

MINOR IN SPEECH, COMMUNICATION, AND THEATER ARTS FOR THE B.A. DEGREE

This minor requires completion of 33 credits including 15 credits in Upper Division courses and departmental approval.

See second paragraph under above major for approval procedures.

MAJOR IN SPEECH FOR THE B.S. DEGREE—GENERAL

Required for students intending to seek teacher certification.

Spch 1-121—Advanced Public Speaking (3)	SPA 1-100—Speech Pathology in Public Schools (2)
Spch 1-202—Interpersonal Communication (3)	SpE 3-800—Problems in Speech Education (4)
Spch 1-301—Introduction to Communication Media (3)	SpE 3-900—Intern Teaching in Speech (3)
Spch 1-701—Oral Interpretation (3)	A minimum of 6 hours from two of the following courses: Spch 3-151, Participation in Forensics (2); Spch 3-411, Radio Workshop (2); SpTh 3-611, Participation in Theater (2)
Spch 3-121—Discussion and Group Methods (3)	Electives in speech, to be approved by the B.S. major advisers (18)
Spch 3-251—Literature of Speech Research (2)	
SpTh 1-500—Introduction to Theater Arts (4)	Total (55)
SpTh 1-502—Theater Arts and Crafts Laboratory (1)	

MAJOR IN SPEECH FOR THE B.S. DEGREE—RHETORIC/PUBLIC ADDRESS

Required for students intending to seek teacher certification.

Spch 1-121—Advanced Public Speaking (3)	SPA 1-100—Speech Pathology in Public Schools (2)
Spch 1-202—Interpersonal Communication (3)	SpE 3-800—Problems in Speech Education (4)
Spch 1-301—Introduction to Communication Media (3)	SpE 3-900—Intern Teaching in Speech (3)
Spch 1-701—Oral Interpretation (3)	A minimum of 4 hours in Spch 3-151, Participation in Forensics (2)
Spch 3-101—Persuasion (3)	Electives in speech, to be approved by the B.S. major advisers (18)
Spch 3-111—Argumentation (3)	
Spch 3-121—Discussion and Group Methods (3)	Total (54)
Spch 3-251—Literature of Speech Research (2)	

MINOR IN SPEECH FOR THE B.S. DEGREE—GENERAL

Required for students intending to seek teacher certification.

Spch 1-121—Advanced Public Speaking (3)
Spch 1-202—Interpersonal Communication (3)
Spch 1-301—Introduction to Communication Media (3)
Spch 1-701—Oral Interpretation (3)
Spch 3-121—Discussion and Group Methods (3)
Spch 3-251—Literature of Speech Research (2)
SpTh 1-500—Introduction to Theater Arts (4)

SpTh 1-502—Theater Arts and Crafts Laboratory (1)
SpE 3-800—Problems in Speech Education (4)
A minimum of 6 hours from two of the following courses: Spch 3-151, Participation in Forensics (2); Spch 3-411, Radio Workshop (2); SpTh 3-611, Participation in Theater (2)
Total (32)

MINOR IN SPEECH FOR THE B.S. DEGREE— RHETORIC/PUBLIC ADDRESS

Required for students intending to seek teacher certification.

Spch 1-121—Advanced Public Speaking (3)
Spch 1-202—Interpersonal Communication (3)
Spch 1-301—Introduction to Communication Media (3)
Spch 1-701—Oral Interpretation (3)
Spch 3-101—Persuasion (3)
Spch 3-111—Argumentation (3)

Spch 3-121—Discussion and Group Methods (3)
Spch 3-251—Literature of Speech Research (2)
SpE 3-800—Problems in Speech Education (4)
A minimum of 4 hours in Spch 3-151, Participation in Forensics (2)
Total (31)

COURSES

Speech (Spch)

- 1-101. RHETORIC OF OUR TIMES.** (3 cr)
Introduces the principles and methods of persuasion in terms of a traditional rhetorical orientation. A study of major theoretical contributions to human discourse and an investigation of the recurring questions facing the user and receiver of contemporary rhetoric.
- 1-111. BEGINNING PUBLIC SPEAKING.** (3 cr; prereq 1-101)
Application of the theoretical bases of rhetoric to the public speaking situation.
- 1-121. ADVANCED PUBLIC SPEAKING.** (3 cr; prereq 1-111)
Preparation and delivery of the persuasive speech.
- 1-202. INTERPERSONAL COMMUNICATION.** (3 cr, §1-201)
An analysis of the role communication plays in interpersonal relationships.
- 1-301. INTRODUCTION TO COMMUNICATION MEDIA.** (3 cr)
A social and critical history of radio, television, and the cinema. Emphasis on the entertainment and informational functions of the media in our society.
- 1-420. BASIC RADIO AND TELEVISION.** (4 cr, §1-411, §1-421)
Operational aspects of radio and television. Theory and techniques of network and local program production and presentation.
- 1-431. BASIC CINEMA.** (3 cr; prereq 1-301 or #; offered when feasible)
Principles and techniques of motion picture production, distribution, and presentation.
- 1-701. ORAL INTERPRETATION.** (3 cr)
Introduction to theory and practice of oral reading of literature.
- 3-101. PERSUASION.** (3 cr; prereq 1-101)
Theory and practice in modern motivational rhetoric.
- 3-111. ARGUMENTATION.** (3 cr; prereq 1-101)
Theory and practice in applying reasoned discourse to analyzing and presenting problems and their solutions to audiences.
- 3-121. DISCUSSION AND GROUP METHODS.** (3 cr; prereq 1-111 or #)
Techniques of problem-solving and study of communication and dynamics within small, task-oriented groups.

Section 2—Major-Minor Requirements and Courses

- 3-151. PARTICIPATION IN FORENSICS.** (2 cr [may be repeated for a maximum of 6 cr])
Practical experience in public and intercollegiate debate, discussion, oratory, oral interpretation, and extemporaneous speaking.
- 3-171. INDEPENDENT STUDY.** (1-3 cr [may be repeated for a maximum of 6 cr; undergraduates may not take more than 6 cr in both 3-171 and 5-171 combined]; prereq #)
Directed readings and projects of interest to the student in the areas of speech/communication, communication media, theater arts, or speech education.
- 3-202. FOUNDATIONS OF COMMUNICATION THEORY.** (3 cr)
An investigation of concepts and theories fundamental to understanding the process of human communication.
- 3-231. COMMUNICATION IN ORGANIZATIONS.** (3 cr)
The communication process in the modern organizational structure. Analysis of the relevant communication problems in business, industry, and education.
- 3-251. LITERATURE OF SPEECH RESEARCH.** (2 cr; prereq speech major/minor-jr standing)
Analysis and evaluation of methods of historical-critical and behavioral research as described in current speech/communication literature.
- 3-341. DOCUMENTARY FILM AND TELEVISION.** (3 cr; prereq 1-301 or #; offered when feasible)
Study of the theories and methods of using the film and television for information, persuasion, and propaganda.
- 3-351. PROJECTS: BROADCASTING.** (2 cr [may be repeated for a maximum of 6 cr]; prereq jr or sr and #)
Directed individual research projects, productions, or intern training at local broadcast stations.
- 3-361. SEMINAR: COMMUNICATION MEDIA.** (3 cr [may be repeated for a maximum of 9 cr]; prereq #)
Directed study, preparation, and presentation of papers or reports on subjects of current interest and importance in the areas of radio, television, and cinema. Specific subject to be announced prior to registration.
- 3-411. RADIO WORKSHOP.** (2 cr [may be repeated for a maximum of 6 cr]; prereq 1-420 and #)
Radio practicum in program production and radio station operation.
- 3-421. TELEVISION WORKSHOP.** (3 cr; prereq 1-420 and #; 6 hrs lab)
Use of television to solve problems in communication and entertainment.
- 3-431. CINEMA WORKSHOP.** (3 cr; prereq 1-431 or #; 2 hrs lect, 3 hrs lab ar; offered when feasible)
Producing, writing, directing, shooting, recording, and editing a motion picture.
- 3-721. ADVANCED ORAL INTERPRETATION.** (3 cr; prereq 1-701 or #)
Theory and practice in selecting, preparing, and presenting programs of oral readings.
- 5-101. HISTORY OF RHETORIC.** (3 cr; prereq 1-101; offered 1972-73 and alt yrs)
The development of rhetorical thought as expressed by representative writers.
- 5-111. RHETORICAL CRITICISM.** (3 cr; prereq 1-101...5-101 recommended; offered 1973-74 and alt yrs)
Problems and methods in the description, critical analysis, and evaluation of the theory and practice of rhetoric.
- 5-121. STUDIES IN PUBLIC ADDRESS.** (3 cr; prereq 1-101...5-101 recommended; offered 1972-73 and alt yrs)
Application of rhetorical theory for the critical analysis of speeches of representative historical figures.
- 5-161. SEMINAR: SPEECH.** (3 cr [may be repeated for a maximum of 9 cr]; prereq jr and Δ)
Directed study and preparation of papers on subjects of current interest. Subjects to be announced prior to registration.
- 5-171. INDEPENDENT STUDY.** (1-3 cr [may be repeated for a maximum of 6 cr... undergraduates may not take more than 6 cr in both 3-171 and 5-171 combined]; prereq sr and Δ)
Directed readings and projects of interest to the student in the areas of speech/communication, communication media, theater arts, or speech education.

Speech Theater (SpTh)

- 1-500. INTRODUCTION TO THEATER ARTS.** (4 cr, §1-501)
Appreciation of theater arts: stage and film. Development of sensitivity and critical sophistication as articulate, discriminating recipients of theater arts. Film and play viewing, play reading, critiques, and term projects.
- 1-502, 3-502. THEATER ARTS AND CRAFTS LABORATORY.** (1 cr [may be repeated in different areas for a maximum of 6 cr in both courses combined]; 30 hrs minimum time)
Practice in various areas of arts and crafts of theater; including construction and painting of scenery and properties, stage operation, lighting, sound, costuming, makeup, publicity, and business management.
- 1-525. THEATER DESIGN AND CRAFTS.** (4 cr, §1-521; prereq 1-500; offered 1972-73 and alt yrs)
Appreciation of theatrical design and crafts. Elements of design for scenery, costumes, and lighting. Historical survey, comparative study with emphasis on current practices.
- 1-535. AMERICAN THEATER HISTORY.** (4 cr, §1-531; offered 1973-74 and alt yrs)
Religious, social, political, and artistic forces that have contributed to the development of the theater in America from colonial times to the present.
- 1-610. FUNDAMENTALS OF ACTING.** (4 cr, §1-601; prereq #; 3 hrs lect, 3 hrs lab)
Designed to develop ability to respond to imaginative situation with sincerity, individuality, and effectiveness; projects in elementary stage technique.
- 3-551. HISTORY OF THE THEATER I.** (4 cr, §3-541; prereq 1-500 or #; offered 1972-73 and alt yrs)
Religious, social, political, and artistic forces that have contributed to the development of the theater in Western civilization from its origins through Spain's Golden Age.
- 3-552. HISTORY OF THE THEATER II.** (4 cr, §3-542; prereq 1-500 or #; offered 1972-73 and alt yrs)
Religious, social, political, and artistic forces that have contributed to the development of the theater in Western civilization from Elizabethan England through German Romanticism.
- 3-553. HISTORY OF THE THEATER III.** (4 cr, §3-543; prereq 1-500 or #; offered 1972-73 and alt yrs)
Religious, social, political, and artistic forces that have contributed to the development of the theater in Western civilization during the 19th and 20th centuries.
- 3-611. PARTICIPATION IN THEATER.** (2 cr [may be repeated for a maximum of 6 cr])
Participation in all areas of theater except for acting.
- 3-612. ADVANCED ACTING.** (4 cr, §3-602; prereq 1-610 and #)
Characteristic styles of acting; projects in character acting and makeup; presentation of acting roles from great plays.
- 3-625. STAGECRAFT.** (4 cr, §3-621; prereq 1-500; offered 1972-73 and alt yrs)
Principles and practice. Planning, construction, painting, and shifting of stage scenery. Practical production experiences.
- 3-635. STAGE LIGHTING AND SOUND.** (4 cr, §3-631; prereq 1-500; offered 1973-74 and alt yrs)
Principles and practice of stage lighting and sound. Practical production experience.
- 3-645. SCENIC DESIGN.** (4 cr, §3-641; prereq 3-625 and #; offered 1972-73 and alt yrs)
Theory and practice in the use of light and space to create a practicable, well-composed, and expressive environment for the produced playscript. Designing for proscenium and arena stages.
- 3-655. STAGE COSTUMING AND MAKEUP.** (4 cr, §3-651; 3 hrs lect, 3 hrs lab; offered 1973-74 and alt yrs)
Theory and practice in designing the actor's external appearance.
- 3-665. FUNDAMENTALS OF STAGE DIRECTION.** (4 cr, §3-661; prereq 1-500 and 1-610; 3 hrs lect, 3 hrs lab)
Principles of stage direction; analysis of plays; preparation of production plan; practice in elementary stage direction; full-scale production of one-act play before invited audience.

Section 2—Major-Minor Requirements and Courses

- 3-666. ADVANCED STAGE DIRECTION.** (4 cr, §3-671; prereq 3-665 and #)
Practice in stage direction; problems of rehearsal, management, and staging of a play; full-scale production of 50-minute cutting from three-act play before invited audience.
- 3-685. SECONDARY SCHOOL PLAY PRODUCTION.** (4 cr, §3-681; prereq #; offered 1973-74 and alt yrs)
For students preparing to teach drama in high schools. All phases of theatrical production will be studied through the rehearsal and performance of a selected play.
- 3-690. ADVANCED THEATER PRODUCTION.** (4 cr, §3-691; prereq sr, 3-666 and #; offered when feasible)
Advanced problems in school and community theater management; special problems assigned to individual students.
- 5-561. SEMINAR IN THEATER.** (3 cr [may be repeated for a maximum of 9 cr]; prereq jr and Δ; offered 1973-74 and alt yrs)
Directed study and preparation of papers and/or projects on subjects of current interest. Subjects to be announced prior to registration.
- 5-690. THEATER WORKSHOP.** (4 cr, §5-691; prereq #; offered 1973-74 and alt yrs)
For in-service directors and advanced students preparing themselves to be drama teachers or to enter the theater professionally; participation in all phases of selected plays; ways to improve stage facilities typically available to the high school drama teacher.

Speech Education (SpE)

- 3-800. PROBLEMS IN SPEECH EDUCATION.** (4 cr, §3-801, §3-802; prereq #)
Examination of theories and procedures in the teaching of curricular speech courses. Study of practices and procedures in organizing, administering, and supervising extracurricular speech activities.
- 3-900. INTERN TEACHING IN SPEECH.** (3 cr; prereq speech B.S. major, 3-800 and #)
Practical experience in the teaching of beginning courses in the department. Students will serve as intern teachers, assisting the instructor in the administration of the course.
- 5-861. SEMINAR: SPEECH EDUCATION.** (3 cr [may be repeated for a maximum of 9 cr]; prereq jr and Δ)
Directed study and preparation of papers on subjects of current interest. Subject to be announced prior to registration.
- 5-881. SPEECH FOR THE CLASSROOM TEACHER.** (3 cr; may not count toward B.S. major or minor in speech; prereq Spch 1-111, jr)
Theory and practice of effective lecturing and the stimulation of productive class discussion. Survey of student-speaking activities suitable to the classroom.

SPEECH PATHOLOGY AND AUDIOLOGY (SPA)

Advisers—Professor Pierce; Associate Professors Friedman, Hatten, Hawk

See Section 4 for master of arts degree program in speech pathology.

The Department of Speech Pathology and Audiology offers a preprofessional bachelor of arts degree.

In attaining the preprofessional degree the student will pursue a liberal arts education (including biology, anatomy, physiology, psychology, mathematics, sociology/anthropology).

Concomitantly, the student proceeds with the study of phonetics, anatomy and physiology of the speech and hearing mechanisms, the normal development of speech and language, the nature of disorders of speech, hearing, and language and their management.

MAJOR IN SPEECH PATHOLOGY FOR THE B.A. DEGREE

SPA 1-990—Introduction to Phonetics (4)	SPA 3-610—Voice Disturbances (4)
SPA 3-110—Introduction to Speech Pathology (4)	SPA 3-710—Hearing Mechanism/Audiology (4)
SPA 3-210—The Speech Mechanism (4)	SPA 3-810—Aural Rehabilitation (4)
SPA 3-310—Articulation Disturbances (5)	SPA 3-910—Clinical Procedures (1-3)
SPA 3-410—Organic Disorders: Aphasia (2)	SPA 5-110—Normal Language Development (4)
SPA 3-420—Organic Disorders: Cerebral Palsy (2)	SPA 5-210—Language Disorders in Children (4)
SPA 3-430—Organic Disorders: Cleft Palate (2)	
SPA 3-510—Stuttering (4)	Total (50)

COURSES

- 1-100. SPEECH PATHOLOGY IN PUBLIC SCHOOLS.** (2 cr, §SpE 1-841)
Function and duties of the speech clinician in the public school system and his relationship to the classroom teacher.
- 1-990. INTRODUCTION TO PHONETICS.** (4 cr, §1-995)
Study and practice in use of the International Phonetic Alphabet with relation to English and certain non-English speech sounds as they occur separately and in connected speech. Designed for the English, modern language, speech, and speech pathology student.
- 3-110. INTRODUCTION TO SPEECH PATHOLOGY.** (4 cr, §3-001; prereq #)
Normal and abnormal speech function. An introduction to disorders of speech and their treatment.
- 3-210. THE SPEECH MECHANISM.** (4 cr, §3-005, §3-050; prereq #)
Study of neurology, anatomy, and physiology as it applies to language formulation, respiration, articulation, and phonation. The propagation and conduction of the speech signal.
- 3-310. ARTICULATION DISTURBANCES.** (5 cr, §3-100, §3-150; prereq 3-210)
Methods of diagnosis and evaluation of functional articulation disturbances. The modification of speech behavior.
- 3-410. ORGANIC DISORDERS: APHASIA.** (2 cr, §3-350; prereq 3-110)
Evaluation and management of the adult aphasic.
- 3-420. ORGANIC DISORDERS: CEREBRAL PALSY.** (2 cr, §3-350; prereq 3-110)
Evaluation and management of the cerebral palsied individual.
- 3-430. ORGANIC DISORDERS: CLEFT PALATE.** (2 cr, §3-300; prereq 3-110)
Evaluation and management of individuals presenting maxillofacial deficits.
- 3-510. STUTTERING.** (4 cr, §3-200; prereq 3-110)
Study of etiologies and management of stuttering.
- 3-610. VOICE DISTURBANCES.** (4 cr, §3-400; prereq 3-210)
Diagnosis and treatment of organic and nonorganic voice disturbances.
- 3-710. HEARING MECHANISM/AUDIOLOGY.** (4 cr, §3-600, §3-650; prereq #)
Anatomy, neurology, and physiology of the hearing mechanism. Hearing disorders. Audiometry as it applies to the public school and clinical setting. Hearing aids and hearing conservation.
- 3-810. AURAL REHABILITATION.** (4 cr, §3-700; prereq 3-710)
Theory, principles, and methods of speechreading and auditory training for acoustically handicapped children and adults. Consideration of visual perception and auditory discrimination. Includes laboratory experience.
- 3-910. CLINICAL PROCEDURES.** (1-3 cr [may be repeated for a maximum of 3 cr], §3-525; prereq #)
Observation and subsequent supervised clinical practicum with speech and/or hearing-impaired persons.
- 5-110. NORMAL LANGUAGE DEVELOPMENT.** (4 cr, §SpEd 5-250; prereq #)
Study of the physical, psychological, and environmental requisites for normal speech and language development. Characteristic phases of language development and implications of language behavior on social and academic adjustment.

Section 2—Major-Minor Requirements and Courses

- 5-210. LANGUAGE DISORDERS IN CHILDREN.** (4 cr, §SpEd 5-251; prereq 5-110 or #)
Investigation into incidence, etiology, diagnosis, and remediation of language disorders in children.
- 5-910. INDEPENDENT STUDY.** (1-3 cr [may be repeated for a maximum of 6 cr]; prereq sr or grad in speech pathology or special education and △)
Directed study, readings, and/or projects of interest to the student in the areas of speech pathology/audiology.
- 8-050. CLINICAL INSTRUMENTATION.** (1 cr; prereq #)
Practice, care, and maintenance of electronic and mechanical instruments designed as clinical tools in the habilitation and/or rehabilitation of the speech and/or hearing handicapped.
- 8-075. PARENT COUNSELING.** (2 cr; prereq #)
Basic orientation to parental counseling for the speech pathologist.
- 8-105. LANGUAGE AND BEHAVIOR.** (3 cr; prereq #)
The role and function of language and language systems in human behavior.
- 8-175. PROBLEMS: SPEECH PATHOLOGY.** (3 cr; prereq #)
Speech screening methods, materials, and subsequent establishment of therapy in public school and paramedical settings. Historical background of speech pathology and its parent organization. Identification and discussion of current professional issues.
- 8-205. CLINICAL SEMINAR: APHASIA.** (3 cr; prereq #)
Theoretical and practical study of the adult aphasic. Submission of a satisfactory paper plus a case study.
- 8-275. CLINICAL SEMINAR: ARTICULATION DISORDERS.** (3 cr; prereq #)
Theoretical and practical study of articulatory disturbances. Submission of a satisfactory paper plus a case study.
- 8-305. CLINICAL SEMINAR: AURALLY IMPAIRED.** (3 cr; prereq #)
Theoretical and practical study of aurally impaired individuals. Submission of a satisfactory paper plus a case study.
- 8-375. CLINICAL SEMINAR: CEREBRAL PALSY.** (3 cr; prereq #)
Theoretical and practical study of the cerebral palsied individual. Submission of a satisfactory paper plus a case study.
- 8-405. CLINICAL SEMINAR: CLEFT PALATE.** (3 cr; prereq #)
Theoretical and practical study of the postoperative cleft palate patient. Submission of a satisfactory paper plus a case study.
- 8-475. CLINICAL SEMINAR: LANGUAGE DISORDERS.** (3 cr; prereq #)
Theoretical and practical study of language-handicapped children. Submission of a satisfactory paper plus a case study.
- 8-505. CLINICAL SEMINAR: STUTTERING.** (3 cr; prereq #)
Theoretical and practical study of those individuals presenting arrhythmical patterns of speech. Submission of a satisfactory paper plus a case study.
- 8-575. CLINICAL SEMINAR: VOICE DISTURBANCES.** (3 cr; prereq #)
Theoretical and practical study of voice disturbances. Submission of a satisfactory paper plus a case study.

UNIVERSITY COLLEGE

Refer to pages 19-20 for additional information.

COURSES

- UC 3-075. INDEPENDENT STUDY.** (3-15 cr)
Interdisciplinary independent study in an area not covered in normal course offerings, typically involving off-campus resources and experiences.

URBAN STUDIES

Coordinator—Associate Professor Olsen

Advisers—Associate Professor Olsen; Assistant Professors Das, Lichty; Instructors Fleischman, Levine

MAJOR IN URBAN STUDIES FOR THE B.A. DEGREE

PREREQUISITES

Freshman, Sophomore Years

Econ 1-004—Principles of Economics: Micro (4)

Econ 1-005—Principles of Economics: Macro (4)

Geog 1-303—Cultural Geography (4)

Geog 1-403—Physical Geography (4)

Pol 1-010—American Government and Politics (5)

Psy 1-003—General Psychology (5)

Soc 1-400—Social Inquiry I (5)

Soc 1-410—Social Inquiry II (5)

Subtotal (36)

REQUIRED

Upper Division Core

Econ 3-803—Public Finance (5)

Geog 3-331—Urban Geography (3)

Pol 3-030—Urban Government and Politics (4)

Pol 3-210—Public Administration I (5)

Pol 3-211—Public Administration II (4)

Pol 3-399—Seminar: Urban Affairs (3)

Pol 5-340—Metropolitan Government and Politics (4)

Soc 3-420—Development of Sociological

Theory (4)

Soc 3-800—Community and Social Organization (4)

Subtotal (36)

Departmental Options—18 credits (minimum) to be selected, in consultation with adviser, from at least *three* of the following departmental groupings:

ECONOMICS

3-346—Principles of Urban Economics (4)

3-361—Regional Economics, Location

Theory (5) (prereq Econ 3-111)

3-362—Urban Economics (4)

GEOGRAPHY

1-305—Environmental Conservation (4)

3-324—Geography of Industrial Location (4)

3-521—Cartography and Map Interpretation (5)

PSYCHOLOGY

3-201—Social Psychology (3)

3-211—Group Dynamics (3)

SOCIOLOGY

3-810—Community Analysis (4)

3-820—Community Research (4)

3-830—Community Development (4)

5-121—Urban Sociology (3)

HUMANITIES

3-073—Humanities in the United States (3)

INTERDISCIPLINARY STUDIES

3-100—Man's Environment and His Future (3)

Subtotal (18)

Total (90)

Urban studies majors are encouraged to investigate field work and internship offerings available through University College and through the Departments of Political Science and Sociology-Anthropology.

SECTION 3

Preprofessional Programs

The Duluth Campus offers many courses for the student who plans to enter a professional school. In addition to preprofessional course requirements, a broad program is available to the student who desires to build a solid background in science, literature, language, social sciences, and the arts.

In certain cases, a student may complete his preprofessional requirements in 2 years. The student is encouraged, however, to avoid narrow specialization during his undergraduate years.

The following are basic programs. Variations and additions may be arranged upon agreement between the student, his preprofessional adviser, and the office of admissions of the professional school in which the student is interested.

Pre-Agriculture

Adviser—Professor J. Carlson

The curriculum provides 2 years of study fulfilling the basic requirements in agricultural science. Students should consult the *College of Agriculture Bulletin* of the Twin Cities Campus for modifications of this program if they plan to enter other curricula in agriculture.

Biol 1-105, 1-106, 1-107, 1-108—General Biology (10)	Econ 1-005—Principles of Economics: Macro (4)
Biol 5-403—General Microbiology (5)	Engl 1-106/1-107—Freshman Composition (8)
Chem 1-103/1-104—General Chemistry (10)	Math 1-110—College Algebra (5)
Chem 1-500—Organic Chemistry (5)	Soc 1-100—Problems of American Society (5)
Econ 1-002—Introduction to Economics (4)	Spch 1-101—Rhetoric of Our Times (3)
Econ 1-004—Principles of Economics: Micro (4)	Spch 1-111—Beginning Public Speaking (3)
	Electives (14)

Electives may be chosen to apply to the social science requirement (15 credits) with a minimum of 5 credits in each of the two fields selected from category 3, Man and Society; or to apply to the humanities requirement (9 credits) of courses selected from category 4, Artistic Expression. Studio courses in art or music may not be applied to this curriculum. See liberal education requirements on pages 41-44.

Other recommended electives: Biol 3-153, 3-773, 5-461.

Pre-Agricultural Education

Adviser—Professor Pearson

The curriculum provides 3 quarters of study fulfilling basic requirements for students planning to major in agricultural education. It will be

necessary for a student to transfer to the College of Agriculture at the end of his first year of work to secure the required courses in technical agriculture and professional agricultural education.

Freshman Year

Biol 1-105, 1-106, 1-107, 1-108—General Biology (10)
Chem 1-110/1-111—General Chemistry (10)
Econ 1-002—Introduction to Economics (4)
Econ 1-004—Principles of Economics: Micro (4)
Econ 1-005—Principles of Economics: Macro (4)

Engl 1-106/1-107—Freshman Composition (8)
Hlth 3-101—Personal and Community Health (3)
Math 1-110—College Algebra (5)
Psy 1-003—General Psychology (5)
Soc 1-100—Problems of American Society (5)
Spch 1-101—Rhetoric of Our Times (3)
Spch 1-111—Beginning Public Speaking (3)

Electives may be chosen to apply to the humanities requirement (9 credits) from the areas of art, literature, music, philosophy, or theater arts. Studio courses in art and music, chorus, and technical courses may not be applied to this curriculum.

Electives may be chosen to apply to the social science requirement (15 credits) from the fields of agricultural economics, anthropology, economics, geography, history, political science, psychology, and sociology. Technical courses such as accounting, statistics, or psychology of learning may not be applied toward this requirement. Courses must be selected from at least two of the above fields with a minimum of 5 credits in each of the fields selected.

Because of certain requirements for a major in this specialized field, students are cautioned to consult with the adviser before undertaking work toward a bachelor of science degree in agricultural education.

Pre-Dentistry

Advisers—Associate Professor H. Collins; Assistant Professor Firling

The following courses, with a total of 135 credits, must be completed during the freshman, sophomore, and junior years:

Biol 1-105, 1-106, 1-107, 1-108—General Biology (10)
Chem 1-110/1-111/1-112—General Chemistry (15)
Chem 3-510/3-511—Organic Chemistry (8)
Engl 1-106/1-107—Freshman Composition (plus 4) (12)

Math 1-110—College Algebra (5)
Phys 1-001/1-002, 1-003—Elementary Physics (12)
Spch 1-101—Rhetoric of Our Times (3)
Electives—especially recommended are Art 1-002, 1-010, 1-400; Chem 3-210; Biol 3-153, 3-243, 3-513, 5-517; Math 1-185

It is also strongly recommended that additional credits be taken in such liberal arts courses as anthropology, economics, history, humanities, language, philosophy, political science, psychology, sociology. Application should be made between October 1 and April 15 of the year prior to the fall quarter the applicant desires to enroll in the School of Dentistry. The American Association Dental Aptitude Test must be taken before the student's application can be considered.

Pre-Engineering

See Engineering in Section 2.

Section 3

Advisers—Professors Moore, Nichol (chemical engineers only); Professors Hanson, Jordan; Associate Professors Kroening, D. Olson, Sydor; Assistant Professors Casserberg, Jackson, Likely, Oakland

Admission Requirements—No formal requirements beyond those listed in Section 1 are demanded of entering freshmen wishing to complete the first 2 years of Lower Division work leading to an engineering degree. However, it is strongly recommended that an entering freshman compare his preparation with the following recent requirements and recommendations of the Institute of Technology, University of Minnesota:

Twelve high school units in grades 10-12 including:

1. Three units in English.
2. Two or more units selected from among history, foreign languages, the social sciences, and the biological sciences.
3. Four years of high school mathematics divided approximately into 2 years of algebra and 2 years of geometry (two and three dimension, including trigonometry).
4. One year of chemistry and 1 year of physics strongly recommended.
5. In recent years, the primary factors considered in determining admissibility, in addition to course requirements, are high school class rank and performance on the ACT mathematics and ACT natural science tests. Very few students are accepted as freshmen when the high school rank is below 60 percentile and the ACT standard scores in mathematics and natural science are below 25.

REQUIREMENTS FOR LOWER DIVISION WORK IN ENGINEERING

Math 1-286, 1-287, 3-288, 3-320, 3-380

Phys 1-030, 1-031, 1-033, 3-060, 3-061, 3-062, 3-070

Chem 1-110, 1-111

Plus 8 credits of English; 3 credits of Computer Math, 8-12 credits of technical electives, minimum of 12 credits of liberal education including a course in Environment and Man

SUGGESTED PROGRAM

		Credits		
First Year		Fall	Winter	Spring
Math 1-286, 1-287, 3-288		4	4	4
Phys 1-030, 1-031, 1-033		4	5	..
EG 1-025		4
Chem 1-110, 1-111		..	4	4
English		4	4	..
Liberal education		4
Total		16	17	12
Second Year		Fall	Winter	Spring
Math 3-320, 3-501, 3-380		4	3	4
Phys 3-061, 3-062, 3-070		..	4	5
Phys 3-060		5
Technical electives:				
Math 3-350, Phys 3-085		..	5	4
(or) MM 1-015, MM 1-016		..	4	4
Liberal education		4	4	..
Total		13	15 or 16	13

Chemistry may be delayed to the second year.

Students who satisfactorily complete at least 90 credits at UMD, including the required courses specified above, will be certified to have completed the Lower Division requirements for transfer to the Institute of Technology. Students planning to enter Chemical Engineering/Materials Science should consult the Department of Chemistry.

Pre-Fishery and Wildlife Management

Adviser—Professor Krogstad

The curriculum provides 2 years of study fulfilling some of the basic requirements in fisheries and wildlife management. For further information, consult the *College of Agriculture Bulletin* and the *College of Forestry Bulletin* of the Twin Cities Campus. The following courses should be completed during the freshman and sophomore years in order to make efficient transfer to the professional program on the Twin Cities Campus:

Biol 1-105, 1-106, 1-107, 1-108—General Biology (10)	Phys 1-001/1-002, 1-003—Elementary Physics (12)
Chem 1-110/1-111/1-112—General Chemistry (15)	Pol 1-010—American Government and Politics (5)
Econ 1-004—Principles of Economics: Micro (4)	Engl 1-106/1-107—Freshman Composition (8)
Econ 1-005—Principles of Economics: Macro (4)	Electives:
Geol 1-110—Introductory Geology (5)	History, geography, economics (3)
Biol 3-773/3-774—General Ecology (5)	Humanities, literature, or arts (not studio courses) (8)
Biol 5-517—Comparative Anatomy of Vertebrates (5)	Biology—Depending on if interest is in fisheries or wildlife (consult with adviser) (10)
Math 1-185—Pre-Calculus Analysis (5)	

Pre-Forestry

Adviser—Professor J. Carlson

The curriculum provides 2 years of study fulfilling the basic requirements in forest resources development. Students should consult the *College of Forestry Bulletin* of the Twin Cities Campus for modifications of this program if they wish to specialize in forest science, forest products, or recreation resource management.

Biol 1-105, 1-106, 1-107, 1-108—General Biology (10)	Geol 1-110—Introductory Geology (5)
Chem 1-103/1-104—General Chemistry (10)	Math 1-110—College Algebra (5)
Chem 1-500—Organic Chemistry (5)	Phys 1-001/1-002—Elementary Physics (8)
Econ 1-005—Principles of Economics: Macro (4)	Spch 1-101—Rhetoric of Our Times (3)
Engl 1-106/1-107—Freshman Composition (8)	Spch 1-111—Beginning Public Speaking (3)
	Electives (29)**

In addition, students must take the 3½-week summer program at the Lake Itasca Forestry and Biological Station following the sophomore year.

** Electives may be chosen to apply to the social science requirement (8-10 credits) with a maximum of 6 credits in each of the fields selected from category 3, Man and Society; or to apply to the humanities requirement (8-10 credits) of courses selected from category 4, Artistic Expression. Studio courses in art or music may not be applied to this curriculum. See liberal education requirements on pages 41-44. Consult with your adviser on related area electives.

Pre-Journalism

Adviser—Assistant Professor Martz

Freshman Year

Engl 1-106/1-107—Freshman Composition (8)
 Pol 1-010—American Government and Politics (5)
 Select from the following science offerings:
 Ast 1-010/1-020—Descriptive Astronomy (6)
 Biol 1-105, 1-106, 1-107, 1-108—General Biology (10)
 Chem 1-103/1-104—General Chemistry (10)
 Language requirement (see current *College of Liberal Arts Bulletin* on the Twin Cities Campus)
 Electives, if necessary, to total at least 45 credits

Sophomore Year

Econ 1-004—Principles of Economics: Micro (4)
 Econ 1-005—Principles of Economics: Macro (4)
 Engl 1-112—Advanced Writing (4)
 Jour 1-105—Journalistic Writing (4)
 Jour 1-110—Visual Communication (3)
 Jour 1-120—Mass Communications Law (2)
 Jour 1-202—News Reporting (4)
 Jour 3-202—Interpretive Reporting (4)
 Jour 3-302—News Editing (4)
 Jour 3-402—History of Journalism (4)
 Select 8 credits from Hist 1-301, 1-302, 1-303—American History
 Electives to total 90 credits at end of sophomore year

Pre-journalism students are advised to elect courses in sociology, psychology, speech, humanities, English or American literature, geography, anthropology, philosophy, and political science.

It is expected that the student be able to type, or learn to type, early in his University career.

This program meets entrance requirements of the University of Minnesota School of Journalism and Mass Communication, accredited by the American Council on Education for Journalism. Students planning to matriculate in another journalism school should study the requirements of that school.

Pre-Law

Advisers—Professor von Glahn; Associate Professor Olsen; Assistant Professor Grau

Since law school entrance requirements differ in the various law schools, the prospective law student should, as early as practical, secure information from the law school he expects to attend. Students should be aware that successful completion of the Law School Admission Test (LSAT) is a requirement for admission to most law schools.

Admission to the University of Minnesota Law School requires the bachelor of arts degree or its equivalent. The degrees of bachelor of science and bachelor of business administration with a well-balanced program will be accepted as the equivalent of the B.A. degree.

The University of Minnesota Law School does not recommend particular areas or departments for prelaw majors. While many law students major in economics, history, or political science, other departmental majors provide good backgrounds for law study and practice. These include such areas as philosophy, the humanities, English, sociology, psychology, mathematics, the physical sciences, anthropology, geography, journalism, speech, classics, and modern languages. The Law School welcomes and encourages a variety of educational backgrounds among its students. It is important that each student's education be as broad as is consistent with the completion of the

major requirements. Therefore, a student should ordinarily endeavor to take his electives in areas not too closely related to his major. For example, a student majoring in mathematics or physics would do well to take his advanced electives in such areas as economics, political science, or history.

The Law School attaches special importance to work that will train a student to express himself in the English language forcefully, effectively, and accurately. A lawyer's whole professional career, whatever his specialty, requires hourly communication of ideas through words, oral and written. Success in Law School, as well as in later years of practice, depends in a considerable measure on development of the capacity for effective verbal expression. Therefore, the student should seize every opportunity to take courses that require independent thought and writing. A student should also develop, through courses or activities, his capacities for expressing himself orally. Knowledge of the principles of accounting will also prove helpful.

Pre-Medical Technology

Advisers—Instructors Hanten, MacLeod

The pre-medical technology student entering the program on the Duluth Campus may take the first 2 years of training here before transferring to the Twin Cities Campus to complete the work; upon the completion of the prescribed curriculum, the student will receive the bachelor of science degree in medical technology. Commencing with fall quarter 1971, all pre-medical technology students must be enrolled in a degree program.

The following courses are prerequisites for admission to the junior year:

Biol 1-011—Human Anatomy (4)	Chem 3-510/3-511—Organic Chemistry (8)
Biol 1-105, 1-106, 1-107, 1-108—General Biology (10)	Engl 1-106/1-107—Freshman Composition (8)
Biol 5-403—General Microbiology (5)	Math 1-110—College Algebra (5)
Chem 1-110/1-111/1-112—General Chemistry (15)	Phys 1-001/1-002, 1-003—Elementary Physics (12)
Chem 3-210—Introductory Quantitative Analysis (5)	Electives in humanities and social science courses to make a total of 90 credits

Pre-Medicine

Adviser—Professor Odlaug

Freshman Year

Biol 1-105, 1-106, 1-107, 1-108—General Biology (10)
 Chem 1-110/1-111/1-112—General Chemistry (15)
 Engl 1-106/1-107—Freshman Composition (8)
 Literature or classics (4)
 Math 1-185—Pre-Calculus Analysis (5)
 Math 1-286—Calculus I (4)

Sophomore Year

Chem 3-210—Introductory Quantitative Analysis (5)
 Chem 3-510/3-511—Organic Chemistry (8)

Phys 1-030/1-031—Introduction to Physics (8)
 Phys 1-033—Introduction to Physics Laboratory (1)
 Phys 1-037—Applied Physics (5)
 9-18 credits from category 3, Man and Society

Junior Year

Biol 3-153—Principles of Genetics (3)
 Biol 5-517—Comparative Anatomy of Vertebrates (5)
 (or) Biol 3-243—Cellular Biology (5)
 (or) Biol 3-513—Developmental Biology (5)
 9-18 credits from category 4, Artistic Expression

Students are strongly encouraged to obtain a Bachelor's degree before entering Medical School.

In addition to the physical and biological sciences, courses in the humanities, social sciences, and behavioral sciences are required.

Preliminary Tests—The Medical College Admissions Test (MCAT) must be taken in May or October of the year preceding the fall term for which the student is seeking admission. In addition, arrangements must be made to take the Minnesota battery of tests.

Application for admission to the Medical School must be filed in the office of the dean of the Medical School between May 15 and November 1 of the year preceding that in which the student plans to enter.

Pre-Nursing

Adviser—Instructor Austin

Since requirements for admission to schools of nursing vary considerably, the prospective student should, as early as possible, secure information from the school where the professional work is to be taken.

The University of Minnesota School of Nursing requires completion of a 1-year preprofessional program during which the student must complete 45 quarter credits with a minimum average of at least 2.00. These 45 credits must include:

1. Anth 1-604 (5 cr)
2. Biol 1-105, 1-106 (5 cr)
3. Chem 1-103/1-104 (10 cr)
4. Engl 1-106/1-107 (8 cr) (or exemption from requirement)

Any remaining credit requirement must be fulfilled by selections from any of Groups A, B, C, or D as described on pages 20-22 of the *School of Nursing Bulletin*. Sixteen quarter credits must be distributed as follows:

1. Cumulative total of 8 credits from:
Group C, Areas 1 and 2
(These credits may include those earned in cultural anthropology)
2. Cumulative total of 8 credits from:
Group A, Areas 1 and 2
(and/or)
Group D, Areas 1 and 2

Pre-Occupational Therapy/Pre-Physical Therapy

Adviser—Assistant Professor Hedman

The University offers, in the Department of Physical Medicine and Rehabilitation, 4-year curricula in both occupational therapy and physical therapy. The programs are open to both men and women. The first 2 years in either may be taken at Duluth. Students in either program should consult the *Occupational Therapy-Physical Therapy Bulletin* and are encouraged to contact the directors on the Twin Cities Campus for specific information regarding the occupational therapy and physical therapy programs. Students applying for transfer to the professional programs on the Twin Cities Campus

should arrange for a personal interview. At Duluth, a total of 90 credits should be completed in the first 2 years. The following courses or equivalents are required:

PRE-OCCUPATIONAL THERAPY

Freshman Year

Art 1-002—Introduction to Art (4)
 Art 1-405—Ceramics (3)
 Biol 1-105, 1-106, 1-107, 1-108—General Biology (10)
 Chem 1-101—Aspects of Chemistry (5)
 Engl 1-106/1-107—Freshman Composition (8) (exemption satisfies this)
 Ind 1-101—Basic Wood Technology (5)
 Psy 1-003—General Psychology (5)
 Soc 1-100—Problems of American Society (5)

Sophomore Year

Biol 1-011—Human Anatomy (4)
 Biol 1-041—Human Physiology (4)

Ind 1-601—Introduction to Graphic Arts (5)
 Hlth 1-101—Personal Health (2) (exemption satisfies this)
 Psy 3-331—Developmental Psychology (5)
 Psy 3-531—Mental Hygiene (3)
 PsyF 5-121—Psychology of Behavior Disorders (4)
 Spch 1-101—Rhetoric of Our Times (3)
 Spch 1-111—Beginning Public Speaking (3)

12 credits in elective courses—These should include courses in sociology, anthropology, speech, language, psychology, humanities, or art; elective courses may be taken on a P-N basis

PRE-PHYSICAL THERAPY

Freshman Year

Biol 1-105, 1-106, 1-107, 1-108—General Biology (10)
 Chem 1-103/1-104—General Chemistry (10)
 Engl 1-106/1-107—Freshman Composition (8) (exemption satisfies this)
 Hlth 1-101—Personal Health (2) (exemption satisfies this)
 Psy 1-003—General Psychology (5)

Sophomore Year

Biol 1-011—Human Anatomy (4)
 Biol 1-041—Human Physiology (4)
 Phys 1-001/1-002—Elementary Physics (8)
 Psy 3-331—Developmental Psychology (5)
 Psy 3-531—Mental Hygiene (3)
 PsyF 5-121—Psychology of Behavior Disorders (4)

27 credits in elective courses—These should include courses in sociology, anthropology, psychology, history, political science, humanities, literature, or art; elective courses may be taken on a P-N basis

Pre-Pharmacy

Adviser—Associate Professor Caple

The pharmacy curriculum is a 5-year course including an optional program which will allow the student to obtain 2 years of pre-pharmacy on the Duluth Campus before entering the College of Pharmacy on the Twin Cities Campus for 3 years of professional study. Applicants who have successfully completed the following courses will be eligible to apply for admission to a 3-year professional curriculum in the College of Pharmacy:

Biol 1-105, 1-106, 1-107, 1-108—General Biology (10)
 Chem 1-110/1-111/1-112—General Chemistry (15)
 (or) Chem 1-120/1-121—General Chemistry (Honors) (10)
 Chem 3-520/3-521/3-522—Organic Chemistry (15)
 Econ 1-004—Principles of Economics: Micro (4)

Econ 1-005—Principles of Economics: Macro (4)
 Engl 1-106/1-107—Freshman Composition (8)
 Math 1-110—College Algebra (5)
 (or) Math 1-185—Pre-Calculus Analysis (5)
 Phys 1-001/1-002, 1-003—Elementary Physics (12)
 Electives (6-10)

Pre-Theology

Adviser—Professor Maclear

The student who intends to enter a theological seminary or to take other special training for religious work should determine as soon as possible what graduate institution he will enter and what prerequisite it requires. (He may also wish to consult with the appropriate UMD Campus chaplain.) In general, the following program corresponds with the recommendations of many seminaries:

1. The student should obtain the following credits:

ENGLISH

Engl 1-504, 1-505—Masterworks of English Literature (8)
Hum 1-022—The Bible as Literature (4)
Spch 1-101—Rhetoric of Our Times (3)
Spch 1-111—Beginning Public Speaking (3)

PHILOSOPHY

Phil 1-001—Introduction to Philosophy (4)
Phil 1-003—Ethics and Society (4)
Phil 1-005—Logic and Scientific Method (5)
Phil 5-011, 5-012, 5-013, 5-014—History of Philosophy (16)

PSYCHOLOGY

Psy 1-003—General Psychology (5)

HISTORY

Hist 1-204, 1-205, 1-206—Civilization of the Modern World (12)
Hist 1-301, 1-302, 1-303—American History (12)

SOCIAL SCIENCES AND EDUCATION

At least 12 credits to be obtained from the following areas: anthropology, economics, education, political science, sociology (at least two of these areas should be represented in each student's program)

2. It is recommended that the student take 6 quarters of either French or German.

Under the present organization of the curriculum at the University this program can best be fulfilled through an English, history, philosophy, or social sciences major and with a minor in any of the foregoing subjects not used as a major or in French or German.

In addition, the attention of pre-theological students is drawn to the following courses which especially relate to some aspect of the study of religion:

Engl 5-331—Milton (4)
Hist 1-054, 1-055, 1-056—Ancient Civilization (12)
Hist 3-280—Church and State in Modern Europe (3)
Hist 3-374, 3-375—Growth of American Thought (8)

Hist 5-124, 5-125, 5-126—Renaissance and Reformation (12)
Lat 1-101/1-102/1-103—Beginning Latin (15)
Phil 3-280—Ethical Theory (3)
Phil 3-421—Oriental Philosophies (4)

Students who plan careers in some special form of religious work (e.g., church secretariat, religious education, church music) are directed to additional course offerings in the departments of business administration, education, music, and sociology-anthropology.

Pre-Veterinary Medicine

Adviser—Assistant Professor Fluegel

The College of Veterinary Medicine will consider qualified students during their third year of the pre-veterinary program. A minimum of 90 quarter-credit hours is required prior to admission to the college. The pre-veterinary student at UMD is not bound by the liberal education require-

ments of UMD but the college urges the student to take liberal education credits similar to the UMD distribution. The latest bulletin from the college can be secured from the UMD counseling office or directly from the College of Veterinary Medicine. Course descriptions may differ between campuses but the following courses should satisfy the recommendations for entrance into the college.

Biol 1-105, 1-106, 1-107, 1-108—General Biology (10)	Phys 1-033—Introduction to Physics Laboratory (1)
Biol 3-153—Principles of Genetics (3)	Math 1-110—College Algebra (5) (depending upon high school background)
Chem 1-110/1-111/1-112—General Chemistry (15)	Math 1-185—Pre-Calculus Analysis (5)
Chem 3-210—Introductory Quantitative Analysis (5)	Engl 1-106/1-107—Freshman Composition (8)
Chem 3-520/3-521/3-522—Organic Chemistry (15)	Spch 1-101—Rhetoric of Our Times (3)
Phys 1-001/1-002, 1-003—Elementary Physics (12)	Spch 1-111—Beginning Public Speaking (3)
(or) Phys 1-030/1-031—Introduction to Physics (8)	Electives from category 3, Man and Society (8 or more)
	Electives from category 4, Artistic Expression (8 or more)

Electives—A student interested in research as a career should involve himself (or herself) in the sciences and mathematics here at UMD. Those interested in medical practice should consider early transfer to the Twin Cities Campus where such courses as animal nutrition and agricultural economics are available. An effective course of study should include at least two sciences or mathematics and a science each quarter.

Application for admission to the College of Veterinary Medicine should be made no later than November 15 (about 1 year prior to desired entrance).

SECTION 4

Graduate Programs

General Information

The Graduate School offers at the University of Minnesota, Duluth a full program for the master of arts degree with majors in art, education, educational administration, educational psychology (school counseling), English, history, and speech pathology. Students may complete all course work at Duluth.

The Graduate School also offers a full program for the master of science degree in biology, botany, chemistry, geology, physics, and zoology. A 2-year program leading to the Certificate Specialist in Education is offered in elementary, secondary, and general school administration. These programs are under the jurisdiction of the dean of the Graduate School and compare in admission, candidacy, and degree requirements with similar programs on the Twin Cities Campus.

Admission to Graduate School

Any student with the Bachelor's degree or its equivalent from a recognized college or university and with satisfactory professional qualifications may make admission application to the Graduate School. The student should *specify his proposed major field* when writing for information to: Assistant Dean of the Graduate School, 403 Administration Building, University of Minnesota, Duluth, Duluth, Minnesota 55812. Application for admission to the Graduate School must be received complete in every detail—two official transcripts of all college work, application forms, credentials examination fee (if required), and any required test results, references, or other information—at least 4 weeks before the opening of the quarter or summer term in which a student expects to register.

Since some members of the graduate faculty may not be in official residence from June 15 until the middle of September, students applying for second summer term or fall quarter admission are encouraged to submit applications early in the spring quarter.

An applicant whose academic record is judged to be unsatisfactory will be refused admission to the Graduate School. In exceptional cases where the record is nearly satisfactory, students may be admitted conditionally.

Seniors—University of Minnesota undergraduates who lack not more than 9 quarter credits toward the Bachelor's degree (*counting required and sequence courses*), if they meet admission requirements, may register in the Graduate School to begin a graduate program while simultaneously completing work for the Bachelor's degree.

Credentials Examination Fee—A credentials examination fee of \$15 is required for each applicant. Persons who were previously officially admitted to and registered in a college of the University of Minnesota are exempt from

this requirement. (This exemption does NOT extend to students previously registered only in Continuing Education and Extension or as "summer-only" students.) Residents of the United States must submit the fee by personal check or money order; foreign applicants must submit the fee by certified bank check. All checks should be made payable to the University of Minnesota. The fee will not be refunded.

Miller Analogies Test—A graduate-level form of the Miller Analogies Test is required of applicants for the following major fields: Educational Psychology (for M.A.), *emphasis in Special Education under any major and for any degree*, and Specialist Certificate.

The Graduate School reserves the right to request additional test data in any case where it is believed necessary.

Additional Tests and Test of English as a Foreign Language (TOEFL)—The TOEFL is required of all foreign applicants whose native language is not English. The University of Minnesota reserves the right to require additional testing upon arrival.

After the scholastic record of an applicant has been reviewed, special tests may be required. The applicant may then be admitted, with or without conditions, as determined in each case by the dean of the Graduate School and an adviser in the student's proposed major.

Special, Summer-only, and Continuing Education and Extension Students—Holders of the Bachelor's degree who are not interested in earning graduate credit may apply to the Admissions Office for admission as special students or register as summer-only students. Continuing Education and Extension students should apply to the Continuing Education and Extension Office. These students, if they subsequently decide to make application for admission to the Graduate School, may use *only their first term's work as a Continuing Education and Extension student, a special student, or summer-only student* in their Master's program. Only courses of graduate character taught by members of the graduate faculty may be used.

Transient Graduate Students—A student currently engaged in an advanced degree program and in good standing in another recognized graduate school who wishes to enroll for a summer session or a single quarter in the Graduate School of the University of Minnesota and who intends thereafter to return to the graduate school in which he is carrying forward his program of studies *for a graduate degree* may be admitted as a *transient graduate student*. He must have previously registered for course work in his graduate school. Transient graduate status may not be granted more than once. Students wishing transient graduate status should request the transient graduate form from the Graduate School Office, 403 Administration Building, prior to registration for the quarter.

Readmission, Change of Major, or Change of Degree Objective—Persons who have not registered in the Graduate School for 2 consecutive years or more must request readmission before registering for classes. Students admitted to the Graduate School but who fail to register for classes within 1 year of their admission date will also be required to reapply for admission. Students who have completed a degree or certification program and who wish to take additional work in the Graduate School must apply for readmission. Persons currently enrolled who intend to change their major field or degree objective from that originally approved by the Graduate School should

request the Change of Status form (GS #72). Readmission or Change of Status forms may be obtained from the Office of the Assistant Dean of the Graduate School. Processing of these requests requires a minimum of 4 weeks prior to the beginning date of classes.

Registration

Directions for registration of students admitted to the Graduate School may be obtained at the Office of the Assistant Dean of the Graduate School at Duluth. Graduate fees are listed in Section 1 of this bulletin and in the *General Information Bulletin* of the University of Minnesota. Before the student can complete his first registration in the Graduate School, he must complete a physical examination by his personal physician unless he has had a physical examination at the University of Minnesota within the previous 2 years.

Graduate registration forms must be signed by a graduate adviser. After payment of fees, these forms are sent to the Twin Cities Campus for approval by the dean of the Graduate School and for entry into the student's graduate record.

Official transcripts of Graduate School students' records are available in the Records Office.

Back-Registration and Cancellation of Courses

Graduate students must complete registration, including addition of courses and cancellation of courses, each quarter by the last day of class and before examinations begin, subject to the privilege fee required for late registration or late payment of fees.

Continuing Education and Extension

A maximum of 12 credits may be transferred from Continuing Education and Extension to the graduate program provided the courses were taken for graduate credit in CEE.

Transfer of Credits

From an Undergraduate College of the University of Minnesota—Credits for advanced courses earned while the student is registered in an undergraduate college can be transferred to the Graduate School only under the following conditions:

If not more than 9 quarter credits of undergraduate credit are lacking (taking into account required sequence courses), a limited amount of graduate work may be carried (approved courses numbered 5-000 and above) for graduate course credit, such courses not to be applied toward an undergraduate degree. The conditions stated apply to the beginning of the quarter in which the courses for graduate credit are carried. Transfer of credit must be arranged by petition to the Graduate School and may not exceed the credits earned in a single academic quarter or summer term. No credit taken under the P-N grading system may be transferred to the Graduate School record.

From Other Institutions—Master's Degrees—A student may transfer from another accredited graduate school a maximum of 9 quarter credits toward the first 45 quarter credits of the Master's degree, Plan A or Plan B, with permission of the graduate director and adviser in his department. Transfer

of credit is not automatic and depends on the individual course. A student should consult with the adviser and/or graduate director in the department where he plans to do his work. Transfer does not apply to graduate work taken as a special, continuing education and extension, or correspondence student.

Specialist in Education—Transfer is permitted from another accredited graduate school except for courses taken as a special, continuing education and extension, or correspondence student. A minimum requirement of 1 academic year, normally 45 quarter credits, or its equivalent, in residence for the program is required. Transfer of credit must be approved by the graduate director and the adviser.

From Special Status or Summer-only Status—A student admitted to, and registered in, the Graduate School may apply to his graduate program *only* the credits earned *in his first academic quarter or summer term* as a special or summer-only student. Such work must be of graduate caliber and taught by a member of the graduate faculty. The student will be granted residence credit for such work.

From Correspondence Study—Graduate credit is *not* allowed for credits earned through correspondence study. Transfer of credit for any of the above is by petition to be filed at the time the student submits his program.

Financial Aids and Other Assistance

A limited number of fellowships and scholarships is available through the Graduate School. Forms for these may be obtained in the Office of the Assistant Dean of the Graduate School or by writing directly to: Graduate Fellowship Office, 309 Johnston Hall, University of Minnesota, Minneapolis, Minnesota 55455. Assistantships are normally granted through the departments and information can be obtained by writing the graduate director of the department. Some residence counseling positions may be available. Write directly to: Housing Office, 159 Administration Building, University of Minnesota, Duluth, Duluth, Minnesota 55812.

Inquiries regarding loan funds, living accommodations, employment, and placement should be addressed to: Vice Provost for Student Affairs, 247 Administration Building, University of Minnesota, Duluth, Duluth, Minnesota 55812.

Requirements for the Master's Degree**

The Master's degree is offered under two plans: Plan A, involving a thesis, and Plan B. Plan B is the only plan available at Duluth for majors in art, biology, education, educational administration, educational psychology (school counseling), English, and speech pathology. Botany, physics, and zoology majors follow Plan A requirements. Chemistry, geology and history majors may select either Plan A or Plan B.

** A limited number of graduate students of exceptional scholastic standing who take the Master's degree may be certified for high school teaching in Minnesota though they lack formal residence at UMD. To qualify for certification under this plan students must meet requirements at UMD and secure the approval of the chairman of the Education and Psychology Division at the outset of their program.

In either of these two plans, it is possible and acceptable under the rules (except in certain specified areas) for the student who is adequately prepared and who can devote full time to graduate study to complete the requirements for the Master's degree in 1 academic year of 3 quarters, or its equivalent in summer sessions.††(Not all major fields afford sufficient course work in summer sessions to meet degree requirements.) A nonresident student who completes his work for the Master's degree in less than 3 academic quarters or 6 summer terms is required to pay tuition for 3 quarters or the equivalent in summer terms. The completion of a Master's program ordinarily requires, however, from 4 to 6 quarters in residence, or its equivalent in summer sessions. Students who are planning to earn the Master's degree under either Plan A or Plan B, therefore, should take into account this customary rate of progress, as well as the minimum possible time interval of 1 academic year. If such matters as self-support, prerequisite work, or special study of foreign languages (or English for foreign students) are involved in attaining the Master's degree, students should anticipate and definitely plan for a period of residence longer than the minimum 3 academic quarters.

Grading System—In courses open to *graduates only*, the student may receive a grade of S—"satisfactory." This indicates the instructor's approval of the quality of the student's work on the graduate level. It signifies a letter grade of at least B but it will not be counted in computing the GPA. Grades A, B, C, or D may be received for these courses. In courses open to both graduates and undergraduates the system of marking by letters is used. A grade point average of at least 2.80 must be maintained over all courses included in the approved degree program and may apply also to all graduate courses taken by the student even if they are not a part of his approved program; a higher level of performance may be required in certain fields. Graduate School students are not permitted to elect P-N grading.

Course instructors may at their discretion place a time limit for removal of incomplete grades. In general it is recommended that grades of incomplete be removed within 1 calendar year. Students with an excessive number of incompletes may be denied further registration until some of the incompletes have been removed.

Admission to Candidacy—Following completion of 9 to 15 graduate credits, at least 3 of which must be in the major, and not later than the opening of the quarter preceding the final quarter or final summer term, the student who expects to obtain a Master's degree shall present his program and his thesis title (for Plan A) or his program (for Plan B) for his adviser's signature. He shall then submit his signed program to the Graduate School for Graduate Faculty Committee action. Blanks for this purpose are provided by the assistant dean of the Graduate School. A transcript of all graduate work the student has taken must accompany the program. Approval by the Graduate Faculty Committee and the Graduate School indicates the student's admission to candidacy for the degree.

Transfer from One Plan for the Master's Degree to the Other—A student accomplishes such a transfer by submitting to the Graduate School a revised program signed by his adviser.

†† One summer term is the equivalent in residence of one-half a school quarter of the regular academic year.

PLAN A: MASTER'S DEGREE WITH THESIS

Major and Minor Work—In choosing a field for major or minor work, the student must present the minimum undergraduate preparation prescribed in the departmental statements. He must complete in the Graduate School a minimum of 18 quarter credits in the major and 9 in the minor with a combined grade point average in the major and minor of 2.80. No graduate credit is allowed for course work of D quality.

In cases where the student takes course work beyond the minimum requirements already stated, both the adviser and the Graduate Faculty Committee may demand comparable standards of performance for all work taken, in evaluating and approving the minimum program submitted, and may reject the minimum degree program if the total record falls below a 2.80 GPA and may also terminate candidacy.

The student's work for the minor must be logically related to his major work. The dean and the Graduate Faculty Committee may in exceptional cases allow the minor subject to be taken in the same department as that of the major.

All requirements for the Master's degree under Plan A must be completed within 7 years. The 7-year period specified includes all work transferred to the graduate record of the individual, whether this transferred work was taken as an adult special student at the University of Minnesota or under any other conditions in which transfer is permitted.

Admission to the Graduate School involves a specified major field. Any subsequent proposal for a change in major necessitates a formal request to the Graduate School.

Language Requirement—Reading knowledge of a foreign language (modern or ancient), the language to be determined by the major department, is required of candidates for the Master's degree, unless exemption is made in individual cases with the approval of the adviser and the Graduate Faculty Committee or the requirement is specifically waived in a given area. A student may establish language proficiency in one of the following ways:

1. Completing as a graduate student at the University of Minnesota 3 quarters of language with no grade lower than C, or an intensive course approved by the dean of the Graduate School.
2. Successful completion of the examination at the end of the course established in Continuing Education and Extension (German, French, Spanish, Italian, Portuguese, and Russian) to aid students in meeting the language requirement.
3. Successful completion of the examination at the end of a course (French, German, and Spanish) offered through the Department of Independent Study.

Note—Courses taken in Continuing Education and Extension or in Independent Study *for credit* may not be used in lieu of the proficiency examination.

4. Presenting evidence of completion, within 5 years preceding certification of 2 years of a language at the college level with a C average, or 1 year of a language at the college level with an average of B or better and a grade no lower than B in the final quarter or semester. Courses may have been taken at the University of Minnesota or at another accredited college or university.

One year is the equivalent of 12 quarter credits or 8 semester credits. Two years is the equivalent of 24 quarter credits or 16 semester credits.

The Graduate School permits transfer of language certification from any institution in the United States whose credits are regularly accepted by the Graduate School, and whose language tests are administered by procedures approved by the Graduate School at Minnesota. Language certification will not be accepted from institutions where the examinations are administered by the student's major department. Certification of language proficiency demonstrated more than 5 years before a student enrolls at the University of Minnesota will not be acceptable.

Where certification at another institution is not possible, and where it would work a hardship on the student to come to Minneapolis or Duluth for an examination, the language departments will send written examinations to be taken wherever the candidate may be, provided proper arrangements for proctoring can be made.

5. Passing a language proficiency examination administered by a foreign language department. The level of the examination is such that a student who has completed 1 year of college foreign language with emphasis on reading, and who has shown higher-than-average proficiency (approximately a B record), would be considered adequately prepared.

Examinations to meet the language requirement of the Graduate School, unless otherwise arranged with the language departments, shall be held on the second Thursday of each quarter and on the second Thursday of each term of the Summer Session.

A repetition of the language examination is considered a special examination for which a fee of \$20 is charged.

6. Taking the Graduate School Foreign Language Test of the E.T.S. Some language departments may elect to administer a standardized foreign language test developed by the Educational Testing Service. For information about which departments use the GSFLT, the student will wish to inquire in the departmental office. A fee is charged the student *each* time he registers for the GSFLT.

Master's Thesis—The student shall submit the title of his thesis and a complete program of the work to be offered for the degree on a form secured at the Office of the Assistant Dean of the Graduate School. The thesis title must be approved by his adviser and by the Graduate Faculty Committee. The thesis should be on a topic falling within the field of the major. The candidate will ordinarily devote approximately half of his time to the preparation of the thesis, including courses on which the thesis is based. The thesis must be written in acceptable English, show the student's ability to work independently, and give evidence of the student's power of independent thought both in perceiving problems and making satisfactory progress toward their solution. Familiarity with the bibliography of the special field and correct citation of authorities are expected.

Five copies of the thesis must be provided in order to facilitate its consideration. Two copies are for the University Library at Minneapolis, one for the Duluth Campus Library, one for the candidate, and normally one goes to the adviser or major department. Three copies must be upon 16-pound or 20-pound linen stock of 75 percent rag content, and the other carbon copies shall be on 13-pound bond paper. The original and first two carbon copies must

contain all illustrative material. Ample margins should be left for binding purposes. The body of the thesis should be double spaced, but footnotes may be single spaced. Multigraph, multilith, and xerox methods of reproduction may be accepted, provided that 16- or 20-pound rag content bond is used.

The thesis must be finished and registered in the Office of the Assistant Dean of the Graduate School *at least 9½ weeks* before the commencement convocation at which the candidate presents himself for his degree. The group committee or the examining committee may require a 30-day interval between the thesis registration and the date of the final oral examination.

The thesis will be examined by a committee of not less than three, appointed by the dean of the Graduate School upon recommendation of the Graduate Faculty Committee. The examining committee will include at least two representatives of the major field and one representative of the minor field. This committee must be unanimous in certifying that the thesis is ready for defense, and a record of this action must be filed in the Office of the Assistant Dean of the Graduate School on the appropriate form before the candidate may be admitted to the final written or oral examination.

A candidate contemplating publication of any material that he expects to present for a thesis should arrange through the Graduate School office to obtain approval, since no material that has been published prior to its approval by the thesis committee may be used to meet the thesis requirement.

If the thesis is accepted, the candidate should immediately begin to have the thesis typed in its final form and pay the graduation fee in the Office of the Assistant Dean of the Graduate School. This fee must be paid *at least 5½ weeks* prior to commencement. Three bound copies of the thesis, including the original, must be in the UMD Graduate School Office *at least 3 weeks* prior to commencement.

Examinations—All candidates for the Master's degree will meet the regular requirements as to examinations, reports, etc., of the classes in which they are registered.

The adviser is expected to call at the Graduate School Office before the student's final examination for the degree to obtain an examination report form for use by the student's committee.

In addition to the usual course examinations, the candidate for the Master's degree Plan A must pass a final written examination, a final oral examination, or both, at the discretion of his examining committee, which must meet collectively and determine the appropriate course of procedure.

If only a final written examination is specified, it must be held not later than *5½ weeks* before the end of the quarter in which the student takes his degree. It will cover the major and minor fields and may include any work fundamental thereto. This examination will be arranged by the adviser as chairman of the thesis committee, the questions to be prepared with the cooperation of the graduate faculty of the major and minor concerned. The chairman will report the results of the examination to the Office of the Assistant Dean of the Graduate School on the appropriate form. A majority vote of the committee is required for approval of the written examination.

If only a final oral examination is specified, it also must be held not later than *5½ weeks* before the end of the quarter in which the student takes his degree. This examination, normally 1 hour in length, will be conducted by the committee appointed to examine the thesis, with the adviser serving as chairman, and will cover both the major and minor fields, including any work fundamental thereto. At the close of the examination, the committee will vote upon the candidate's performance, and a majority vote is required for ap-

proval. The chairman of the committee will then report the result of the vote to the Graduate School on the appropriate form.

If both a written and an oral examination are specified, the written examination must precede the oral examination, and the time of completion of the oral examination indicated above must be adhered to. Committee certification of the thesis must precede the final oral examination.

Reports—Forms are provided for signed reports concerning the thesis and the final written or oral examinations. All reports must be filed in the Office of the Assistant Dean of the Graduate School *5½ weeks before the end of last quarter.*

SUMMARY OF REQUIREMENTS FOR MASTER'S DEGREE WITH THESIS

<i>Requirements</i>	<i>Under the Direction of</i>	<i>Date</i>
Initial registration	Adviser and assistant dean	On entrance
Approval of degree program, language choice, thesis subject, and candidacy	Adviser, committee (normally from the major department, division, or college), Graduate Faculty Committee, and dean of the Graduate School	After completion of 9 to 15 credits or no later than the opening of quarter preceding final quarter
Language requirement (completion)	Adviser and language department	Before admission to written or oral examination
Registering of thesis	Assistant dean's office	9½ weeks before graduation
Certification of thesis	Thesis committee	Before admission to final written or oral examination
Final examinations, written or oral or both	Major adviser and committee	} Not later than 5½ weeks before commencement in which the student takes his degree
Filing of thesis	Assistant dean's office	
Graduation fee	Assistant dean's office	

PLAN B: MASTER'S DEGREE WITHOUT THESIS

The requirements under this plan in matters of admission, residence, and language requirements follow Plan A. Under Plan B, the student must pass either a final written examination or a final oral examination or both, at the discretion of his committee. The committee must meet collectively and determine the appropriate course of procedure. This examination, if oral, will normally be an hour long. Plan B differs in substituting for the thesis a heavier course requirement which if met in summer sessions means more than the minimum 4 terms under Plan A. While it does not permit an indiscriminate scattering of courses over unrelated fields, it does not stress concentration on one major and one minor field. It is understood that more than one field will be included outside the field of concentration. Insofar as it has a professional aspect, the Master's degree under Plan B is less a test of research interest and more adapted to individuals who will profit by a broader range of knowledge in their fields. Whether taken for professional or cultural purposes, the requirements under Plan B are meant to test interests and intellectual abilities for a different purpose but not on a different level from those for Plan A.

Under Plan B, candidates for the Master's degree must complete, with a GPA of 2.80, a minimum of 45 quarter credits in graduate courses. Certain departments require a B average. No graduate credit is allowed for course work of D quality. At least 21 of the 45 credit hours must be in the major field. Not less than 18 of the 45 credits must be offered in at least two related fields with a minimum of 6 credits required in each. It should be kept in mind

that these are minimum requirements and that some major fields require more. Papers representing the quality but not the range of the Master's thesis shall be prepared in three advanced courses or seminars or in problems courses or courses which permit independent work under faculty supervision and involve 9 credits. This requirement may be satisfied with a combination of the above which is acceptable to the Graduate School. The work may be done either in the major field or in related fields. In most major fields, such courses are identified by a single asterisk; in fields where courses are not so identified, the student should consult his adviser.

In cases where the student takes course work beyond the minimum requirements stated, both the adviser and the Graduate Faculty Committee may demand comparable standards of performance for all work taken and may reject the minimum degree program if the total record falls below the 2.80 average required for the Plan B degree.

All requirements for the Master's degree Plan B must be completed within 7 years. The 7-year period specified above includes all work transferred to the graduate record of the individual, regardless of whether this transferred work was taken as a special student at the University of Minnesota or under any other conditions in which transfer is permitted.

Intelligent planning of the student's program requires that he present to his adviser a statement of all college work completed with credit. In planning his program the student should not include in "related fields" any courses from the field of concentration.

Under this plan, the candidate will be examined by a committee of not less than three members, normally two from the major and one from a related field, appointed by the dean of the Graduate School upon recommendation of the Graduate Faculty Committee. The adviser is expected to call at the Graduate School Office before the student's final examination for the degree to obtain an examination report form for use by the student's committee. This examination may be written or oral or both, at the discretion of the examining committee. The student will make available to the examining committee for its review the papers prepared to fulfill the requirement of 9 hours of independent work. Procedures for the examination are the same as those already described for the Master's degree Plan A.

SUMMARY OF REQUIREMENTS FOR MASTER'S DEGREE WITHOUT THESIS

<i>Requirements</i>	<i>Under the Direction of</i>	<i>Date</i>
Initial registration	Adviser and assistant dean	On entrance
Approval of program of all graduate work, with credits, showing major field and language choice, and of candidacy	Adviser, committee (normally from the major department, division, or college), Graduate Faculty Committee, and dean of the Graduate School	After completion of 9 to 15 credits or no later than the opening of quarter preceding final quarter or summer term
Language requirement (completion)	Adviser and language department	Before admission to written or oral examination
Final examinations, written or oral or both	Adviser and committee	} Not later than 5½ weeks before commencement in which student takes his degree
Graduation fee	Assistant dean's office	

Departmental Statements

A synopsis of information concerning each major field is listed below, but is subject to change at any time. Further details are available from the *direc-*

tors of graduate study as designated for the various majors. Courses in each area are listed in Section 2 of this bulletin under the departmental headings.

General information concerning graduate work on the Duluth Campus may be obtained from the Office of the Assistant Dean. The complete University of Minnesota *Graduate School Bulletin* may be obtained in person from the Office of the Assistant Dean, 403 Administration Building at UMD, or by writing to the Graduate School, 316 Johnston Hall, University of Minnesota, Minneapolis, Minnesota 55455, when requesting that a copy be mailed. The ZIP code of the recipient is required for the mailing of all bulletins.

ART

Degree—M.A. (Plan B) Education (Art Education)
M.A. (Plan B) with emphasis in studio work
Director of Graduate Study—Professor Glenn C. Nelson

Prerequisites for Admission—Designed primarily for the art teacher. Normally, public school certification for the teaching of art is expected as a prerequisite for admission to the program. The department will consider other bases for admission, however, when the program seems particularly adaptable to the objectives of the student.

Prerequisites for admission include completion of not less than 9 quarter credits in Upper Division art history and 36 quarter credits in studio art, 18 of which must be Upper Division work in painting, sculpture, and prints. Students with a satisfactory record of the 36 quarter credits but without all prerequisites in art history and/or the studio areas will be allowed to make up prerequisites concurrently with graduate work.

M.A. Degree—Education (Art Education)

Candidates for this degree must have teacher certification, but may make up education prerequisites concurrently with graduate courses. In general the studio courses taken should be in several areas rather than featuring a concentration which is often found in the M.A. in studio. The education degree requires a research project of 9 credits in an area of art education. The final oral examination will cover the contents of this research and its supporting paper.

This degree may be completed in 3 quarters plus summer sessions or by attendance in several summer sessions. A minimum of 45 quarter credits is required in the following areas:

	Credits
Major—Art Education and Education	21
Related Field—Studio Art	18
Second Related Field—Art History, Sociology, English, or other	6
Total	45

M.A. Degree—Studio Art

Recommendation for admission to the program, approval of the student's creative project and supporting paper is made by the departmental graduate committee. Normally the committee nominates an appropriate faculty member to direct the development of the creative project and supporting paper. A satisfactory exhibition of the student's work in the Tweed Museum of Art

is a major requirement of the M.A. in Studio Art degree. An oral examination covering course work and the area of the supporting paper is the final step in completion of the degree.

While concentration in one of the studio areas may be desirable in certain cases, it is expected that students interested in teacher training will plan work in several studio areas. It is recommended that art history be used as one of the related areas for all students. For those students with objectives in teacher training, the second related field of art education is recommended. Full-time attendance for 3 quarters plus summer sessions is required to complete the M.A. in Studio Art degree. A minimum of 45 quarter credits is required in the following areas:

	Credits
Major—Studio Art	27
Related Field—Art History	9-12
Second Related Field—Art Education, History, English, or other	6-9
Total	45

In general all candidates should have an overall B average in undergraduate course work, a minimum of low grades in any area, and relatively high achievement in the major field. Applicants for graduate teaching assistantships should submit personal recommendations and slides of major studio projects after acceptance into the program.

BIOLOGY

Degree—M.S.—Plan A in Botany

Plan A in Zoology

Plan B in Biology

Director of Graduate Study—Associate Professor Hollie L. Collins

Prerequisites for Admission—For major work, general biology (Biol 1-105, 1-106, 1-107, 1-108 or equivalent) and at least 20 credits in biological sciences approved by the department. For minor work, general biology (Biol 1-105, 1-106, 1-107, 1-108 or equivalent). It is strongly recommended that the prospective candidate have a background in chemistry, mathematics, and physics; deficiencies in these areas must be corrected prior to registration for certain courses.

Language Requirement—None.

Candidacy—Automatic upon official approval of Plan A or Plan B program.

Major and Minor Requirements—Appropriate courses, depending on the student's background, will be determined by the student's advisory committee within the department. For Plan A in botany or in zoology, a minimum of 18 quarter credits in the major and 9 quarter credits in the minor are required with a combined GPA of 3.00. For Plan B in biology, candidates must complete, with a GPA of 2.80, 45 quarter credits in graduate courses, 21 of which must be in the major field. Not less than 18 credits must be taken in two related fields, with a minimum of 6 credits required in each.

Other Requirements—*Plan A*: thesis, written comprehensive examination, final oral examination. *Plan B*: an acceptable paper in each of three ap-

proved advanced courses for a total of 9 credits, and a final oral or written examination.

CHEMISTRY

Degree—M.S. (Plan A or B)

Director of Graduate Study—Professor James C. Nichol

Prerequisites for Admission—Undergraduate chemistry major, 1 year college physics, 2 years college mathematics including calculus and differential equations, advanced inorganic chemistry, and a full year of physical chemistry.

Language Requirement—Plan A: Proficiency in German, with substitution or waiver permitted by petition to the department in special cases. Proficiency may be demonstrated (a) by completion of 10 credits of college work with a grade of B or better, or 15 credits with a grade of C (the equivalent in transfer credits may be accepted), or (b) by making a passing grade on the language examination administered by the Graduate School. Plan B: None.

Candidacy—Automatic upon official approval of Plan A or Plan B program.

Thesis Research Areas for Plan A—Analytical chemistry; biochemistry; inorganic chemistry; organic chemistry; physical chemistry.

Major Requirements—18 credits in the major field for Plan A and 21 credits in the major field for Plan B, the specific program being worked out to best serve the interests of the student.

Minor Requirements—9 credits of related supporting courses for Plan A, and 18 credits of course work in at least two related fields, with a minimum of 6 credits in each, for Plan B.

Other Requirements—*Plan A*: thesis. *Plan B*: a total of 45 credits in graduate courses. Final oral examination for Plan A and final oral or final written examination for Plan B at the discretion of the examining committee. For both Plan A and Plan B proficiency examinations must be taken prior to first registration, and attendance at the weekly chemistry seminar is required.

EDUCATION

Degree—M.A. (Plan B) (for elementary and secondary teachers)

Directors of Graduate Study—Professor Harry C. Johnson (for elementary teachers); Professor John E. Verrill (for secondary teachers)

Interested students should contact the elementary or secondary departmental office to obtain information concerning new programs or modifications in old ones that may not be included in the current bulletin.

Prerequisites for Admission—A minimum of 18 quarter credits in undergraduate work in education will be required. Ordinarily, applicants should hold a teaching certificate. Applicant should indicate his undergraduate major and the field he wishes to emphasize at the graduate level when applying for admission.

Language Requirement—None.

Candidacy—Automatic upon official approval of Plan B program.

Major Requirements—21-27 credits in courses from among the following three areas: education (Educ), elementary education (ELED), and secondary education (SeEd). Write to the Graduate School Office, Duluth Campus, or to the director of graduate study for list of suggested basic courses for major and related fields.

Related Fields Requirements—Minimum of 18 credits in two or more fields outside of education (Educ), elementary education (ELED), and secondary education (SeEd). At least two of these fields should have not less than 6 credits in each one.

Other Requirements—Final oral or written examination.

EDUCATIONAL ADMINISTRATION

Degree—M.A. (Plan B)

Director of Graduate Study—Assistant Professor Karl J. Vander Horck

Prerequisites for Admission—Bachelor's degree and elementary teaching certification for those desiring to meet qualification for the elementary principalship, or secondary teaching certification for those desiring to meet qualification for the secondary principalship. Students must apply for admission to the Graduate School. Applicants must have a strong academic background with reasonable breadth of subject matter interest. Candidates for admission will be screened by a reviewing committee; a personal interview may be required.

Language Requirement—None.

Candidacy—Automatic upon official approval of Plan B program.

Major Requirements—21-27 credits in educational administration courses, with a field of concentration in either elementary or secondary administration. Included in these 21-27 credits are 9 credits for a Plan B paper.

Related Fields Requirements—Minimum of 18 credits in fields outside of educational administration; 6 of these credits are in recommended core courses, and the remaining credits are selected from a list of supportive courses.

Information concerning the program of studies may be obtained by writing to the Graduate School Office, or to the director of graduate study.

Other Requirements—Final oral or written examination, or both.

Specialist Certificate

Director of Graduate Study—Assistant Professor Karl J. Vander Horck

Prerequisite for Admission—Students must apply for admission to the Graduate School. Applicants must have a strong academic background with a reasonable breadth of subject matter interest. As a part of admissions procedure the Miller Analogies Test is required and students will be interviewed by the Committee on Educational Administration.

Language Requirements—None.

Candidacy—Automatic on official approval of program for the Specialist Certificate.

Major Requirements—Minimum of 48 credits with a field of concentration in elementary, secondary, or general administration. A 6-credit research paper and service in an internship are required. In exceptional cases the internship may be waived.

Related Field Requirements—Minimum of 42 credits in supporting courses outside educational administration including 9 credits in related academic areas.

Students with a Master's degree in educational administration will normally be able to apply all their course work to their program (45 quarter credits). Students with a Master's degree in other areas may be required to take additional credits.

Information concerning the program and for other requirements consult the assistant dean of the Graduate School, UMD, or the director of graduate studies in educational administration.

Other Requirements—Final oral or written examinations, or both.

EDUCATIONAL PSYCHOLOGY

Degree—M.A. (Plan B)

Director of Graduate Study—Professor Moy F. Gum

Prerequisites for Admission—Minimum of 6 quarter credits in psychology, satisfactory performance on Miller Analogies Test, evidence of social service activities and experiences related to guidance interests, and recommendation of previous employer. Successful teaching preferred (required for state public school certification).

Language Requirement—None.

Candidacy—Approximately a B average in graduate studies and official approval of Plan B program.

Major Requirements—Minimum of 38 credits in psychological foundations (PsyF) courses, of which 9 credits will count toward the research paper requirement (see below).

Related Field Requirements—Minimum of 22 credits in at least two fields outside the major as authorized by the director of graduate study.

Other Requirements—Completion of research papers totaling 9 credits (PsyF 8-050), final written comprehensive, and, when required, an oral examination.

ENGLISH

Degree—M.A. (Plan B)

M.A. (Plan B) with emphasis on teaching

Director of Graduate Study—Professor Joseph E. Duncan

M.A. (Plan B)

Prerequisites for Admission—Not less than 27 quarter credits in English literature, 12 of which must be of Upper Division grade, including satisfactory

courses in Chaucer, Shakespeare, Milton, and the English language. Certain course prerequisites may be taken concurrently with graduate work.

Candidates will ordinarily find it necessary to supplement their undergraduate work by a considerable amount of independent reading.

Language Requirement—Satisfactory performance on language reading examination in French, German, Latin, Greek, Italian, Spanish, or Russian.

Candidacy—Automatic upon official approval of Plan B program.

Major Requirements—21-27 credits.

Related Fields Requirements—Minimum of 18 credits in two fields outside the major with minimum of 6 credits in each. One of these related fields may be American literature or the English language.

Other Requirements—A written examination 5 hours in length, calling for some knowledge of the following fields: the English language or Middle English; English literature of the Renaissance, Restoration, and 18th century, and English and American literature of the 19th and 20th centuries.

At least 1 week before his final comprehensive examination, the candidate must submit three papers, each about 5,000 words in length, certified as satisfactory by a member of the graduate faculty. Each paper will normally be written in connection with a graduate course.

M.A. (Plan B) with Emphasis on Teaching

Prerequisites for Admission—A minimum of 32 credits in English literature, 16 of which must be of Upper Division grade.

Language Requirement—Same as for regular M.A. degree.

Major Requirements—21-27 credits.

Related Fields Requirements—Minimum of 18 credits in two fields outside the major with minimum of 6 credits in each. One of these fields must be speech.

The requirements for a major and two related fields may be met in the following ways:

	Credits
Major—English Language and Literature	24-28
First Related Field (outside the Department of English)—Speech	6- 9
Second Related Field (inside the Department of English)—English Education (Methods)	8-12
Total	45-46
Major—English Literature and English Education (Methods)	24-28
First Related Field (outside the Department of English)—Speech	6- 9
Second Related Field (inside the Department of English)—Language and Composition	8-12
Total	45-46

Other Requirements—The candidate will be given a comprehensive examination, which will have both written and oral sections. This examination

will test the student's knowledge in the following fields: literary analysis, speech and rhetoric, language and composition, and methods.

The requirement regarding Plan B papers is the same as in the regular M.A. (Plan B) program (see above).

GEOLOGY

Degree—M.S. (Plan A or B)

Director of Graduate Study—Professor John C. Green

Prerequisites for Admission—Undergraduate major in geology, geophysics, or related earth sciences with 1 year each of college mathematics including calculus, college chemistry, and college physics. Candidates with degrees in chemistry, physics, biology, engineering, or other disciplines may be admitted on a case-by-case basis.

Language Requirement—None.

Candidacy—Automatic upon official approval of Plan A or Plan B program.

Requirements—*Plan A*: thesis. *Plan B*: acceptable papers. Advisory examination during the first quarter of residency. Final oral examination.

HISTORY

Degree—M.A. (Plan A or B)

Director of Graduate Study—Professor Ellis N. Livingston

Prerequisites for Admission—(a) General survey courses in two or three of the following areas or periods: Ancient, European, English, or American; (b) a minimum of 2 full-year advanced or Upper Division courses (or their equivalent in two of these areas or periods), including at least one course in which intensive work has been done.

Language Requirement—Satisfactory performance on language reading examination in French, German, Spanish, or other language acceptable to the department, or prior achievement as specified in general language requirement statement.

Candidacy—Automatic upon official approval of Plan A or Plan B program.

Major Requirements—*Plan A*: 24 credits in major including Hist 8-001 plus thesis. *Plan B*: 24 credits in major including Hist 8-001, 18 credits in two American history subareas with a minimum of 6 credits in each, and 9 credits of seminar or proseminar courses. One week before final examination, candidate must submit three papers, exhibiting evidence of research techniques and writing adaptability.

Minor and Related Fields Requirements—*Plan A*: minor of 9 credits in one related field. *Plan B*: minimum of 18 credits in two related fields.

Other Requirements—Plan A candidates are required to take a final oral examination covering the thesis, two subareas of American history, and the minor. A written examination may be required at the discretion of the committee. Plan B candidates are required to take a final oral examination covering major and minor fields, and a written examination may be required at the discretion of the committee.

PHYSICS

Degree—M.S. (Plan A)

Director of Graduate Study—Professor Thomas F. Jordan

Prerequisites for Admission—2 years of college physics plus differential and integral calculus.

Language Requirement—None.

Major Requirements—18 credits of approved physics courses numbered above 5-100 including at least 9 credits chosen from 5-126 or 5-127 or 5-128 (only one of these three), and 5-175, 5-176, 5-180, 5-181 and 5-182.

Minor Requirements—9 credits in mathematics or chemistry minor.

Other Requirements—Thesis; written comprehensive examination; final oral examination.

SPEECH PATHOLOGY

Degree—M.A. (Plan B)

Director of Graduate Study—Associate Professor John T. Hatten

Prerequisites for Admission—Bachelor's degree in speech pathology or 49 quarter hours in speech pathology, audiology, and speech science.

Language Requirement—None.

Candidacy—Automatic upon official approval of Plan B program.

Major Requirements—30 credits to include core courses SPA 8-050, 8-075, 8-105, 8-175 (9 credits); electives (21 credits).

Related Field Requirements—Minimum of 18 credits from education, special education, and psychological foundations with a minimum of 6 credits in two of the above.

Other Requirements—Final written and oral examination.

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Wayland R. Swain, Ph.D.
Richard J. Ziegler, Ph.D.

Instructor

Caryl B. Bentley, B.A.
Arthur W. Hafner, M.S.
Susan E. Johnson, M.A.

SCHOOL OF SOCIAL WORK—DULUTH

John F. Jones, Ph.D., *Professor and Director*

Richard C. Broeker, Ph.D., *Associate Professor and Associate Director*

Professor

Ira H. Holland, Ed.D.
John F. Jones, Ph.D.

Associate Professor

Richard C. Broeker, Ph.D.
C. David Hollister, Ph.D.

Pralhad D. Kulkarni, D.S.S.
Frances E. Skinner, M.S.W.

Assistant Professor

Romine R. Deming, Ph.D.

Instructor

Connie J. Boltz, M.S.W.

Nancy J. Hooyman, M.A.

AMERICAN INDIAN STUDIES PROGRAM

Robert E. Powless, M.S., *Instructor and Director*

OFFICES AND SERVICES

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Bookstore—James L. Stuberg, B.B.A.

Business Office—Harry F. Zabrocki, B.A.

Computer Center—John L. Gergen, Ph.D.

Continuing Education and Extension—James J. Kafka, Ph.D.

Educational Media—Bruce L. Lehan, B.A.

Food Services—Clifford R. Stayton

Graduate School—M. Harry Lease, Jr., Ph.D.

Health Service—Henry J. Jeronimus, M.D.

Intercollegiate Athletics—Ralph A. Romano, B.A.

Library—Rudolph Johnson, M.A.

News Service—Julian B. Hoshal, M.A.

Planetarium and Observatory—Donald H. Jackson, B.S.

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Printing and Graphic Arts—Harry E. Watts, M.S.

Speech and Hearing Clinic—Robert F. Pierce, Ph.D.

Student Affairs

Vice Provost for Student Affairs—Theodore E. Kellogg, Ph.D.

Assistant to the Vice Provost—C. Dean Kjolhaug, M.A.

Admissions—Mrs. Marjorie S. Austin, M.A.

Advisement and Orientation—Norbert L. Fox, M.A.

Counseling—Bruce J. Rutherford, M.A.

Financial Aids—Nicholas F. Whelihan, M.A.

Housing—Craig E. Peterson, M.A.

Placement—Havard W. Archerd, B.A.

Records—Gerald R. Allen, B.Th.

Student Activities and Kirby Student Center—Neale L. Roth, M.Ed.

Summer Session—James J. Kafka, Ph.D.

Vending—Donald M. Oberg

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ADDENDA TO GRADUATE PROGRAMS LISTED

SOCIAL WORK

Degree --- M.S.W. (Plan B)

Director of Graduate Study --- Professor John F. Jones

PREREQUISITES FOR ADMISSION --- Bachelor's degree, evidence of academic potential to meet requirements for graduate education, background in social and behavioral sciences, personal and professional qualifications appropriate to social work practice, and interest in and commitment to social development.

LANGUAGE REQUIREMENT --- None

CANDIDACY --- Automatic upon approval of Plan B program

REQUIREMENTS --- 63-93 total credits with 9 credits minimum from either Social Work or related fields. A written examination and preparation of one Plan B paper in relation to a Held Project or three shorter papers written in connection with Preparation for Field Project (SW 8-301), Proseminar in the Theory and Practice of Social Intervention (SW 8-401) and Social Development Symposium (SW 8-402).

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MASTER OF ARTS IN EDUCATION (MUSIC EDUCATION)

Degree --- M.A. (Plan B) Education (Music Education)

PREREQUISITES FOR ADMISSION --- Candidates for this degree must have an undergraduate degree with a major emphasis in music. Ordinarily, applicants should qualify for a teaching certificate.

CANDIDACY --- Automatic upon official approval of Plan B program

MAJOR REQUIREMENTS --- The major in Education with an emphasis in music requires a minimum of 21 credits of which 9 credits in a research project are included. The final examination will cover the contents of this research and its supporting paper. Students must maintain a 3.00 GPA in the major area.

RELATED FIELDS REQUIREMENTS --- A minimum of 18 credits is required in two additional fields outside the major. It is recommended that one field be in music.

OTHER REQUIREMENTS --- Final oral or written examination on research project.

The following is a suggested program leading to the Master of Arts degree in Education with an emphasis in Music Education.

Major --- Music Education and Education -----	21-24 credits
Related Field --- Music -----	6-18 credits
Second Related Field --- (minimum of 6 credits in any approved field offering graduate credit) -----	6-18 credits
TOTAL -----	45-48 credits